"A CRITICAL STUDY OF DEVELOPMENT OF INDIAN NATIONAL CURRICULUM WITH SPECIAL REFERENCE TO SCIENCE EDUCATION, SOCIAL STUDIES AND INFORMATION TECHNOLOGY AT SECONDARY SCHOOL LEVEL SINCE INDEPENDENCE"

ABSTRACT
THESIS

SUBMITTED FOR THE AWARD OF THE DEGREE OF

Doctor of Philosophy

IN

EDUCATION

BY

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2006


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ABSTRACT

For a long time the curriculum for Indian schools was decided by the colonial rulers. After Independence (1947) Government of India had made several efforts to update the curriculum of secondary schools in India. In its narrower sense curriculum is the plans made for guiding learning in schools, usually represented in retrievable documents of several levels of generality, and the implementation of those plans in the classroom; those experiences that take place in a learning environment that also influences what is learned. The relationship between the curriculum and the course of study is an important one for clear understanding of curriculum programs. Curriculum and course of study are sometimes used synonymous. In its broader sense curriculum is the totality of subject matter, activities and experiences which constitute a pupil's school life. A dynamic curriculum has to keep pace with the changing times, help in fulfilling the needs of the individuals and society. Many commissions and committees were set up to study the needs of children and to study the nature of curriculum followed in the schools. NCERT (National Council for Educational Research and Training) was established in 1961. According to an international comparative study of school curriculum, National Institute for Educational Research, 1999, the NCERT is the national apex research institution which was set up as an autonomous body under the Government of India. Its mandate is to assist and advice the Government of India in the formulation and implementation of policies and programmes in the field of school

education. It came out with a broad nationwide curriculum framework for the first time in 1975. 'National Curriculum for the ten year schools – A framework (1975)' was the first attempt of its kind. Second was 'National Curriculum for Elementary and Secondary Education (1988). The third curriculum framework was brought out in the year 2000. It was National Curriculum Framework for School Education (2000). At present the curriculum in Indian Schools is based on this framework. But when this was brought out there was a lot of hue and cry upon it especially on social studies curriculum. Hence the investigator was keen to find out the opinion of students as well as teachers about the new curriculum in Science, Social Studies and Information Technology. Teachers are the best judges to assess the quantum of learning experience that needs to be incorporated in the curriculum. The need of the day is to make the curriculum learner oriented.

Only a few studies have been found discussing the curriculum in Science, Social Studies and Information Technology at Secondary School level. Even in those studies the opinion of students and teachers regarding the curriculum they follow and its effects have not been discussed. In view of the significance of the involvement of teachers and students during curriculum planning, implementation, evaluation and the gaps in the existing research studies, the present study is likely to provide valuable insight into this aspect of curriculum development.

OBJECTIVES OF THE STUDY:

To make an in-depth study of the secondary and senior secondary school science and social studies curriculum and the science and social

studies NCERT textbooks for classes IX, X, XI & XII of UP in regard to the following aspects.

1. To trace the historical development of curriculum with special reference to social studies and science at secondary school level in India since Independence.
2. To find out how far the schools are making use of Information Technology in the teaching – learning process of the students.
3. To analyse the opinion of lower secondary students of some CBSE schools in UP about the science curriculum prevalent in their schools.
4. To analyse the opinion of lower secondary students of some CBSE schools in UP about the social studies curriculum prevalent in their schools.
5. To find out the opinion of lower secondary school teachers of science about the prevalent curriculum of science in CBSE schools of UP at Secondary School level.
6. To find out the opinion of lower secondary school teachers of social studies about the prevalent curriculum of social studies in CBSE schools of UP.
7. To find out the opinion of senior secondary students of some CBSE schools in UP about the science curriculum prevalent in their schools.
8. To find out the opinion of senior secondary students of some CBSE schools in UP about the social sciences curriculum prevalent in their schools.

9. To find out the opinion of senior secondary school teachers of science (PCB group) about the prevalent science curriculum in CBSE schools of UP at Senior Secondary School level.
10. To find out the opinion of senior secondary school teachers of social sciences about the prevalent social sciences curriculum in CBSE schools of U.P. at senior secondary school level.

METHODOLOGY:

For carrying on the study primary and secondary sources were used. For the study of secondary sources the investigator has visited NCERT, Dr. Zakir Husain Library, Jamia Millia Islamia, New Delhi, M.A. Library, A.M.U., Aligarh, Delhi University, ICSSR, New Delhi and Ministry of Education, New Delhi Information from students and teachers regarding the new curriculum in science, social studies and information technology was collected through primary sources by means of questionnaires. These seven types of questionnaires developed by the investigator were the tools of the study.

Questionnaire (A) consisted of 20 statements related to the textbooks of science followed by 20 statements related to the textbooks of social studies. This was meant for students of class IX and X to find out their opinion regarding NCERT Science and Social Studies textbooks and Science & Social Studies Curriculum.

Questionnaire (B) was meant for the Science teachers of class IX and X to find out their opinion about the IX and X class NCERT Science textbooks and Science Curriculum.

Questionnaire (C) was constructed for the Social Studies teachers of class IX and X to find out their opinion about the NCERT textbooks they teach and the Social Studies Curriculum.

Questionnaire (D) was developed for the XI and XII class students of Science to find out their opinion about the textbooks of Physics, Chemistry and Biology. It includes statements related to curriculum in Physics, followed by Chemistry and Biology.

Questionnaire (E) was constructed for the XI and XII class teachers of Physics, Chemistry and Biology. It contains items related to the above subjects of class XI and XII NCERT textbooks and Physics, Chemistry and Biology Curriculum.

Questionnaire (F) had statements related to the NCERT textbooks and curriculum in History followed by Geography, Political Science and Economics. This was given to the students of class XI and XII studying the above- mentioned subjects

Questionnaire (G) had statements related to class XI and XII textbooks of History, Geography, Political Science and Economics Curriculum. This was meant for the teachers teaching any of the above mentioned subjects.

All the above Questionnaires related to curriculum in Science and Social Studies had statements covering various aspects of the subject like textbooks, application of the subject in daily life, use of Information Technology in learning the subject, Interest and attitude of the students, development of skills, method of teaching, Achievement, General awareness of the subject and its social competence.

SAMPLE:

(i) Sample of students:

In the sample 600 students from class IX and 600 students from class X were chosen. Again, 600 students of class XI belonging to Life Science Group i.e. (PCB) were chosen and 600 students belonging to social studies stream (Geography, History, Political Science and Economics) were chosen.

Similarly from class XII, 600 students from Life Science Stream (Physics, Chemistry and Biology) and 600 students from Social Science Stream i.e. (History, geography, Political Science and Economics) were chosen.

(ii) Sample of teachers:

Teachers were selected from the cities like Agra, Aligarh, Allahabad, Bareilly and Lucknow. Finally 150 teachers of Science each taking classes IX-X were selected. Similarly 150 teachers of social studies each taking classes IX-X were selected. 150 teachers of class XI-XII (Physics, Chemistry and Biology) were selected. Again 150 teachers of class XI-XII social sciences (History, Geography, Political Science and Economics) were selected. All these teachers constituted sample of the present study. Also teachers undergoing B.Ed. training programme through IGNOU (Indira Gandhi National Open University) were chosen for this purpose. These teachers belonged to schools of different areas in U.P. They were selected at random during the workshops of IGNOU B.Ed. programme at Aligarh and Lucknow.

The data so collected has been presented in appropriate tables. The frequency and percentage of responses have also been calculated, then interpretation of data was done.

MAJOR FINDINGS:

Major Findings of Secondary School Students and Teachers (class IX & X) regarding Secondary School Science & Technology Textbooks and Science Curriculum:

Major findings of the study are as follows:

1. Science & Technology textbooks are easy and understandable. Subject matter is also interesting but the syllabus is lengthy and sometimes burdensome. They wanted separate books for Physics, Chemistry and Biology. The Science course was related to community living, it was complete in itself, language in the textbooks was also quite lucid and simple. But examples, figures, graphs etc. should be more in number. Prescribed experiments were found to be easily performable in school labs. It encouraged learning by doing, increased curiosity and power of reasoning and observation, but it did not develop economic efficiency and capacity to learn livelihood. But the old course was better in providing social competence in students. The present curriculum in Science & Technology is also based on the psychological principles of learning.

Major Findings of Secondary School Teachers and Students regarding Social Studies Curriculum of Class (IX-X):

Teachers opinion was that social studies textbook is understandable for the students but students found it to be uninteresting and also lengthy. Both students and teachers agreed that there should be separate books for studying History, Geography, Political Science and Economics. It helps develop national awareness and international understanding also social studies curriculum develops sense of appreciation. There should be separate books of History, Geography, Political Science and Economics to study social studies. But the social studies course is not integrated with IT. Textbooks provided sufficient material on the subject. Both students and teachers found the curriculum complete in itself. Teachers opined that social studies curriculum is not sensitive to changing needs and values of the society, but students opined that it was not upto the mark in resolving contemporary social and individual problems. They also opined that social studies course is not correlated with other subjects. Teachers opined that it is experience – based, it enables the students gain insight in spiritual, economic and political values. It helps children develop an insight into human relationships, social values and attitudes. But it does not intend to promote the values and ideals of Humanism, Secularism, Socialism and Democracy. Also it helps children develop an insight into human relationships, social values and attitudes. The teachers agreed that the objectives of new course could be achieved under present conditions and circumstances.

Major Findings of Senior Secondary Science (PCB) teachers & students of Class (XI & XII) about their Physics, Chemistry and Biology Curriculum:

According to the students the contents of the Physics textbooks are difficult but Chemistry and Biology are not difficult. Students found the subject matter in Physics and Chemistry textbooks not very interesting. But Biology was interesting. Chemistry curriculum was lengthy but Physics was not lengthy. Physics, Chemistry and Biology Curriculum was wide and comprehensive. Textbooks were affordable in price. Semester system of education was liked by them. Syllabus was not integrated with IT. There was correlation between Physics and Chemistry, but Biology course was not correlated to Physics or Chemistry. The textbooks also provided sufficient material on the subject.

Chemistry course could be covered in limited time but Physics and Biology could not be covered within the time frame of the school. The curriculum developed scientific attitude and skills required at Senior Secondary school level. The curriculum was complete in itself. Physics & Biology curriculum was community based but Chemistry was not. It encouraged learning by doing, language of the textbooks was lucid, simple and precise. It contained necessary examples, figures, graphs etc. The experiments given in the textbooks were feasible to be performed in the school laboratory. The agreed that their course was sufficient enough to help them compete national level medical, engineering and other entrance examinations.

Teachers opined that content in Physics textbooks is difficult, but Chemistry and Biology is not. Subject matter is interesting, but lengthy, wide and comprehensive. Curriculum is flexible. Physics and Biology course is integrated with IT but Chemistry and Biology is not. But the curricula is mutually correlated. Textbooks provided sufficient material on the subject. Course content was quite enough. Curriculum in Physics, Chemistry and Biology is related to community living, develops scientific attitude and skills required at Senior Secondary School level curriculum is complete in itself. Physics textbooks did not contain necessary examples, figures, graphs etc. The teachers opined that curriculum developed in students economic efficiency and capacity to earn livelihood. Curriculum developed in students curiosity and power of reasoning and observation in students. It provided scientific outlook, i.e. free from prejudices and based on tolerance. It trains pupils for efficient application of the knowledge of principles and theories of Science. Physics Curriculum does not have utility in the practical life of students, whereas Chemistry Curriculum has. Curricula in Physics, Chemistry and Biology are based on the psychological principles of learning. Physics teachers said their labs are not well equipped to perform all the experiments in school laboratory. But Chemistry and Biology teachers were satisfied with their labs.

Major Findings of Senior Secondary School Teachers and Students of History, Geography, Political Science and Economic regarding the Curriculum of same:

Class XI students found History, Geography, Political Science Curriculum difficult. Class XII students and teachers said it was quite understandable. Subject matter in the textbooks was quite interesting. Class XI & XII students found History Curriculum quite lengthy. But teachers opined that it was neither lengthy nor short but appropriate. Class XI students found Geography & Economics Curriculum rigid but it was found flexible by teachers as well as students. Students found the textbooks affordable in price. They agreed that semester system of education was good for them. Class XI students did not find History, Geography & Economics course much correlated with other subjects. History teachers opined so but all others their curricula were correlated with different disciplines of social sciences. None of them said that they make use of computers while teaching learning process of these subjects. Class XI students said that History textbooks did not provide sufficient material on the subject while others provided. They agreed that curriculum was complete in itself. They said language used in the textbooks was quite simple and precise but class XI students believed that the curriculum in History did not develop an insight into human relationships, social values, foster national feelings and did not promote international understanding. Whereas class XII students said that it does develop the above qualities. Students opined that the curriculum in History was successful in developing critical appreciation of the past so

that pupils personality is free from prejudices, parochialism and communalism. Class XI students opined that Geography curriculum is linked with life skills whereas class XII students said that it was not so. They found Geography curriculum experience based and increased curiosity, power of reasoning and observation. Students agreed that the curriculum in Political Science develops insight into political values as forces in human behaviour and human relationships and promotes values and ideals of humanism, secularism, socialism and democracy. According to them Economics curriculum integrates theory and applied politics as far as possible. Class XI students agreed that it develops economic efficiency and capacity to earn livelihood but class XII students did not agree to this. The teachers felt that the curriculum in these subjects was sufficient enough to develop the necessary aptitude and skills required at senior secondary school level. Teachers agreed that the textbooks contained necessary examples, figures, graphs, maps etc. Geography, Political Science and Economics teachers felt that the new curriculum was sensitive to changing needs and values of the society. While History teachers did not agree with this viewpoint. Except history teachers others agreed that the curriculum provided sufficient knowledge and skills required at senior secondary school level. Except History teachers others agreed that the content of the subject will enable the pupils to rise above the narrow parochial, chauvinistic and obscurantist tendencies. Teachers agreed that their curriculum developed an insight into various democratic processes. History teachers felt that all the areas of the subject were not given equal importance in the new curriculum. Teachers also felt that

course content of the new syllabus when compared with the old syllabus is more. They said the curriculum developed insight into human relationships, social values and attitudes and promoted the values and ideals of humanism, secularism, socialism and democracy and agreed that the objectives of new syllabus could be achieved under present conditions and circumstances.

CONCLUSION:

Curriculum forms the gamut of classroom activities. It includes not only the written course of studies but also includes the intended learning experience to be assimilated by the students based on teaching and learning experience.

It is more than obvious that curriculum development is a planned exercise which calls for ingenuity, experience and aptitude. It is the teachers who translates and implements instructional plans into action. Curriculum calls for planning and conceptualization from the stage of formation of syllabus to evaluation. The need of the day is to make the curriculum learner oriented. The curriculum in Science and Social Studies can be made more attractive for students and teachers. Information Technology is still only in primitive stage it has to be improved if the schools wish to face the challenges of their time efficiently. The present study has however been only indicative and the findings of the study warrant further indepth probe into the various aspects of curriculum development and implementation.

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2006

Dedicated

to my

little niece (Umamah)

and

to my parents

CONTENT

PROF. C.P.S. CHAUHAN
Chairman

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Dated: 08.12.2006.

CERTIFICATE

This is to certify that the thesis entitled **"A Critical Study of Development of Indian National Curriculum with Special Reference to Science Education, Social Studies and Information Technology at Secondary School level since Independence"** has been completed under the guidance of Mrs. Qamar Jahan, Reader in Education (Women's College, A.M.U.) by **Ms. Khalida Akhtar**. The work is original and independently pursued by the candidate.

Since Mrs. Qamar Jahan has retied, I as Chairman of the Department permit the candidate to submit the thesis for the award of the degree of Doctor of Philosophy in Education by the Aligarh Muslim University, Aligarh.

(Dr. C.P.S. Chauhan)
Chairman
Department of Education
Aligarh Muslim University
Aligarh - 202002

DECLARATION BY THE INVESTIGATOR

I, Khalida Akhtar, hereby declare that the thesis entitled **"A critical study of Development of Indian National Curriculum with Special Reference to Science Education, Social Studies and Information technology at Secondary School Level since Independence"** is a record of investigation carried out by me. The same is being submitted towards the fulfilment of the requirements for the award of the degree of Doctor of Philosophy (Education) to the Department of Education, Aligarh Muslim University, Aligarh. The said thesis has not previously formed the basis for the award of any degree or diploma or other similar title or recognition.

Aligarh

December, 2006

(KHALIDA AKHTAR)

LIST OF TABLES

LIST OF ABBREVIATIONS USED

AMU	-	Aligarh Muslim University
B.Ed.	-	Bachelor in Education
CABE	-	Central Advisory Board of Education
CBSE	-	Central Board of Secondary Education
DCETA	-	Department of Computer Education and Technological Aids
DOE	-	Department of Education
Freq.	-	Frequency
GOI	-	Government of India
ICSE	-	Indian Certificate of Secondary Education
ICSSR	-	Indian Council of Social Science Research
IGNOU	-	Indira Gandhi National Open University
ISC	-	Indian School Certificate Examination
IT	-	Information Technology
MHRD	-	Ministry of Human Resource Development
MOE	-	Ministry of Education
NC	-	National Curriculum
NCERT	-	National Council for Educational Research & Teaching.
NCFSE	-	National Curriculum Framework for School Education
NIE	-	National Institute of Education
NIER	-	National Institute of Educational Research
NPE	-	National Policy on Education
PCB	-	Physics, Chemistry, Biology
Resp.	-	Responses
SCERT	-	Central Board of Secondary Education
U.P.	-	Uttar Pradesh (A State in India)
%age	-	*Percentage*

PREFACE

For a long time the curriculum for Indian schools was decided by the colonial rulers. After Independence (1947) Government of India had left no stone unturned in order to update the curriculum of secondary schools in India. A dynamic curriculum has to keep pace with the changing times, help in fulfilling the needs of the individuals and society. Many commissions and committees were set up to study the needs of children and to study the nature of curriculum followed in the schools. National Council for Educational Research and Training (NCERT) was established in 1961 at New Delhi, which played a very significant role in updating the curriculum of secondary schools. It came out with a broad nationwide curriculum framework for the first time in 1975. 'National Curriculum for the ten year schools – A framework (1975)' was the first attempt of its kind. Second curriculum framework was brought out in 1988. It was National Curriculum for Elementary and Secondary Education (1988). The third curriculum framework was brought out in the year 2000. It was National Curriculum Framework for School Education (2000). At present the curriculum in Indian schools is based on this framework. But when this was brought out there was a lot of hue and cry upon it. Hence the investigator was keen to find out the opinion of students as well as teachers about the new curriculum. Hence the need and significance of the study.

Social Studies and Science are not stagnant but rather ever changing curricula they form very important part of secondary school

curriculum. The need to provide current happenings and real world applications to them means that teachers must use such current sources as electronic media that go beyond rigid textual materials. Information Technology is the need of the hour, hence it has become necessary to make use of IT in teaching learning process. Computers create an influential effect on the teaching-learning processes. With the use of computers in the classroom schools would become more student centered and that more individualized learning would take place than ever before. The need of the day is to make the curriculum learner oriented as well as value oriented. It is thus mandatory on the part of the teachers to be familiar with the modus operandi of the curriculum. The investigator has conducted the study of curriculum with special reference to Science, Social Studies and Information Technology. It was conducted by following adequate methodology and by using proper research tools. After six years of hard work, the investigator was able to complete this work. The present volume is the report of the same.

The report has been organized into six chapters. Chapter 1, namely 'Introduction', provides the background of the problem, high lights its need and significance, and then the research problem selected by the investigator has been properly defined. Also definition of the key terms vis-à-vis states the delimitations of the problem.

Chapter 2 is a review of the related literature and it contains the research studies done in India and Abroad related to the curriculum implementation, analysis and development of secondary school curriculum mainly Science, Information Technology and Social Studies.

Chapter 3 focuses the efforts carried out by the Indian Government in improving the curriculum of secondary schools with special reference to Science, Social Science and Information Technology. It provides the recommendations of various committees, commissions and policies brought forward by the Government of India in order to enrich the secondary school curriculum since Independence.

Chapter 4 is Design and Procedure which has outlined the specific objectives of the study, the methodology adopted, sample selected, tools developed & used and the procedure carried out for collecting data.

Chapter 5 presents the results of data analysis in the form of tables and their interpretations.

Chapter 6 is the last chapter of the report which includes Findings, Conclusions, Implications and Suggestions for further research.

ACKNOWLEDGEMENT

First of all I thank Almighty ALLAH, the most gracious and merciful who gave the gift of expression and insight needed for the completion of this work.

I have great pleasure in expressing my deep sense of gratitude to my respected supervisor **Mrs. Qamar Jahan**, Reader, Department of Education, Aligarh Muslim University, Aligarh for her suggestions, cooperation and cordial attitude during the completion of this work.

I am equally grateful to Prof. C.P.S. Chauhan, Chairman, Department of Education, A.M.U., Aligarh for his cooperation in completion of my thesis.

I would like to express my profound sense of gratitude to late Prof. Mohd. Sharif Khan (Retd.) Department of Education, whose valuable guidance and constructive suggestions provided the much needed continuity.

I am indebted to all my teachers especially Prof. Anwar Jahan Zuberi, Prof. Nabi Ahmad, Dr. Nikhat Nasreen, Dr. Wadoodul Haq, Dr. Nasreen, Dr. Mujibul Hasan Siddiqui for their inspiration and cooperation.

I must also acknowledge with thanks the help and cooperation extended to me by the Principal, Teachers and students of Secondary Schools during data collection and their support to make the study a grand success.

I am grateful to the Library staff of NCERT, SCERT, NIEPA, ICSSR, JMI, New Delhi, Tagore Library, University of Lucknow, M.A. Library, Aligarh and to the Seminar Librarians of the Department of Education, A.M.U., Aligarh for providing excellent cooperation.

I am sincerely thankful to all members and staff members of Department of Education, A.M.U., Aligarh and to Mr. Asif Khan (UDC) for his kind cooperation.

I am also thankful to all my colleagues, friends, my parents, sister Rashida Akhtar and her daughter Umamah for their cooperation, support and continuous encouragement for the completion of my thesis.

I am very much thankful to Mr. Kafeel Ahmad Khan, who painstakingly typed my manuscript.

(KHALIDA AKHTAR)

CHAPTER 1

INTRODUCTION

1.0.0 Need of the study:

For a long time the curriculum for Indian Schools was decided by the colonial rulers. After Independence (1947) many commissions and committees were set up to study the needs of children and the nature of curriculum followed in the schools. With the passage of time, new developments and new technologies came into existence and any growing civilization cannot afford to remain in isolation from the new changes. A dynamic curriculum has to keep pace with the changing times, help in fulfilling the needs of the individuals and society. The basic structure of the curriculum remained same by and large. Science was introduced in the schools after ten years of independence. From 1960 to 2006, the knowledge in science and its effect on technology grew very fast throughout the world. In order to catch up with the developed countries of the world many new concepts were added in the original science curriculum of 1960. Study of science and its application has to influence basic human values as well as provide material and cultural amenities to every member of the society.

So is the case with social studies, it was taught in Indian Schools since Independence. But with the passage of time more and more new concepts were to be incorporated into the curriculum of secondary schools. Science and Social Science is a great human enterprise. They need to be treated as one of the critically crucial curricular areas.

Information Technology (IT) gained popularity only a decade ago in Indian Secondary Schools. They began to make use of computer to study various subjects. Also a separate subject called computer science

was included into the school curriculum. The use of computer is expanding extremely rapidly in various areas of human activities. The IT is assuming the proportion of a revolution and is likely to sweep the world within a few years. It has been found after a comprehensive study of the related literature that the studies have covered fields such as;

Gothiverekar, S.R. (1947) studied secondary school curriculum in the province of Bombay. Veerappa, N.S. (1958) studied trends in Science Education, Chanana; P.S. (1967) conducted critical study of the development of the High School Curriculum in Punjab during the 20th century. Pillai, K.S. (1968) investigated into the changes in the content and scope of the Primary and Secondary School Curriculum in Kerala during the last thirty years (since 1934). Ghosal, T. (1973) conducted an Inquiry into the Curricular Trend in the Secondary Schools of India during the British Rule. Shukla, G.B. (1975) carried out a critical study of Curriculum Development at the Stage of Elementary Education in the state of Gujarat, 1940-1970, Singh, U.S. (1977) studied development of a curriculum in Science for Secondary Schools in the State of Maharashtra. Uppal, S.S. (1977) studied development of curriculum in science for secondary schools in the State of Maharashtra. Sali, V.Z. (1978). Investigated into the Difficulties in Implementing New Curriculum of the Secondary Schools and Remedies for it – a critical study, Ghorai, I. (1980) conducted a research study on the new curriculum of Secondary Education. Muttaqi, I.A. (1981) studied development of a curriculum in Biology for Secondary Schools of Bangladesh. Sharma, Y.K. (1982) studied growth and Development of Science Education in Bihar, Pande, P. (1984) conducted an Analytical Study and Development of Secondary

School Curriculum in Maharashtra. Sharma, H.L. (1984) conducted a critical study of the development of school science education in India from 1947 to 1977. Om Vikas (1997) conducted a case study on Information Technology, Maheshwari, A.N. (1997) conducted a study on Information and Communication Technologies in School Education. Saxena, A.B. (1998) studied Effective Science Teaching in schools and suggested some points to be kept in mind by the curriculum framers to make the curriculum relevant to the learners like improving the quality of learning, suggested models for curriculum construction, strategies for conceptual change.

From the above studies it can be said that a great deal of research work has been done on the curriculum development since British rule, but problem was felt that a study was required which would analyse the curriculum in Science, Social Studies and Information Technology as these are crucial curricular areas at secondary school level. Hence the investigator has studied in detail the recommendation of various commissions, committees and policies of Education brought forward since Independence which have tried to update curriculum and kept pace with the changing times.

The formation and development of curriculum is the product of experiences of students and teachers put in the form of guidelines. These guidelines are the information or knowledge to be passed on to next generation. A curriculum is the journey and not the destination. Any curriculum to be prepared is to be handled carefully.

In India there is an autonomous organization called NCERT (National Council for Educational Research and Training) in New Delhi, which is concerned with the qualitative improvement in school education. It brought forward a document called Curriculum for the ten year school – A framework in 1975 and the National Curriculum for Elementary and Secondary Education: A framework in 1988. Recently, in the year 2000, another document called "National Curriculum Framework for School Education" (NCFSE) – A discussion document was brought forward by NCERT. The main feature of this curriculum framework is that it had integrated the teaching of Science & Technology rather than simply teaching Science as a subject. And therefore there was a change in pattern of teaching Science. Similarly social studies curriculum had also undergone a drastic change upon which there was a lot of hue and cry by many well known Historians, Professors and some intelligentia which can be understood by the following evidences.

According to the English daily "The Times of India, 6th February, 2002, there was a plea against change in History syllabus and a notice was given by Delhi high court on Monday to NCERT and Central Board of Secondary Education on a petition challenging the proposed deletion of certain portion from history textbooks. These sections reportedly make unflattering references to prevailing customs in certain religions and castes in India.

According to Professor Sumit Sarkar, Professor of History, Delhi University, in his article "Does Indian history need to be rewritten" it is

nobody's contention that the NCERT books are perfect, but any revision must be based on at least a minimum level of competence in the subject.

Rajeev Dhavan, a legal expert in his article "textbooks and communalism" has written that actions of the Government, the CBSE and the NCERT constitute a politically sponsored censorship of books and ideas.

Anil Bordia, Former Education Secretary, Govt. of India, has written that the NCERT had undertaken two earlier exercises to develop curricular guidelines. The curriculum for the Ten year school – A framework in 1975 and the National Curriculum for Elementary and Secondary Education: A framework in 1988, were both processed in meetings of NCERT and meetings in which education ministers of all states and UT's participated.

A surprising thing about the new National Curriculum framework according to Anil Barodia, is that it does not seem to have been validated by a process of consensus building. The new framework was not processed in a meeting of CABE (Central Advisory Board of Education) and it was released even before the meeting of the council.

At present the course taught in CBSE schools in India is based on document i.e. NCFSE-2000.

Therefore, investigator was keen to find out the opinion of students as well as teachers about the new curriculum. Hence the need and significance of the present study.

1.1.0. Statement of the problem:

It is from the perspective reflected in the above discussion that the present problem for study has emerged. The problem is formally formulated and stated as:

"A critical study of development of Indian National Curriculum with special reference to Science Education, Social Studies and Information Technology at Secondary School level since independence."

As is evident this problem purports to trace the Historical Development of Curriculum in Science, Social Studies and integration of Information Technology in them at secondary school level since Independence till the formulation of National Curriculum Framework for School Education 2000.

The basic assumption in the mind of the investigator is to know the present position of Curriculum in Science, Social Studies and Integration of Information Technology with special reference to secondary schools in Uttar Pradesh (U.P.) a state in India by finding out the views of teachers and their students regarding the curriculum of the above subjects in five cities of U.P. (Agra, Aligarh, Allahabad, Bareilly and Lucknow). And to trace the historical development of Indian National Curriculum at secondary school stage.

The objectives and the methodology of the study have been stated more formally in the fourth chapter which is devoted to 'Design and Procedure' of the study.

1.2.0 Key terms defined:

The definitions of the key terms facilitate thorough understanding of the statement and objectives of the study. Important key words / terms used under these captions have been operationally defined below. Wherever possible experts' views have been incorporated to make operational characteristics of these terms more clear.

Curriculum:

According to Encyclopaedia of Education, the word curriculum is derived from a Latin word "Curricle" which means two wheeled chair, usually drawn by two horses.

In its restricted sense the word curriculum indicates a group of subjects arranged in a particular sequence. Some times it also includes the selection and arrangement of the content or the topics in various subjects. The broader concept involves all elements of experience rather than only one i.e. the content of the subject taught. In other words it includes all learning experiences and activities which are designed by the school to achieve the objectives of education.

Definition and analysis of the term "Curriculum" is given in the Journal of Indian Education, Vol. XXC, Number 3, Nov. 1999 as follows:

Westburg and Steimer (1971) hold that curriculum is a methodological enquiry exploring of the range of ways in which the subject matter, elements of teacher, student, subject and the milieu can be seen.

Curriculum is a constantly changing and emerging frame of reference to be felt or sensed in school rather than a thing to be mechanically manipulated. The investigators view of curriculum is that "Curriculum is a result of decisions regarding following matters:

(i) Statement of aims

(ii) Selection and arrangement of curricular areas

(iii) Selection and arrangement of content for different stages of education; and

(iv) Pattern of learning and teaching experiences.

National Curriculum (NC):

According to Encyclopaedia of Education, "A national curriculum can be understood broadly as systematic programs and practices for educating a country's population.

National Curriculum (NC) actually means the programmes of study that schools must provide, that cover the whole of compulsory education, for pupils from 5 to 16 years old. The NC specifies which subjects pupils must study and provides a framework for their assessment.

For example, from January 2000, pupils in 9th class must study English, Hindi, Mathematics, Science, Social Studies, Physical Education and a modern foreign language.

Pupils will normally be assessed at the end of session by sitting in CBSE examinations.

Indian National Curriculum:

The curriculum prepared by NCERT, New Delhi is called Indian National Curriculum. It is adopted by CBSE schools and adopted/adapted in most parts of the country. The national curriculum subjects in India are English, Hindi, Mathematics, Social Science, General Science, A regional language/any other Indian language. The national curriculum is for all and it must promote the goals of socialism, secularism and democracy as enshrined in our constitution and it needs to develop manpower for different levels of economy.

National Council of Educational Research and Training (NCERT):

It was established on 1st September 1961. It is an autonomous organization registered under the Societies Registration Act XXI (1860).

The main objectives of NCERT are to assist and advise the Ministry of Human Resource Development, Govt. of India, in implementing policies and major programmes in the field of Education, particularly school education. The council is fully financed by the Govt. of India. Qualitative improvement of school children and teacher education is one of the major concerns of the NCERT.

Central Board of Secondary Education (CBSE):

The Central Board of Secondary Education is an autonomous organization under the Ministry of Education. It conducts Secondary and Higher Secondary examinations for the schools affiliated to it. The Central Board of Secondary Education generally follows the courses and

textbooks prepared by the NCERT in the subjects of Science, Mathematics and Social Sciences.

Secondary School Curriculum:

Secondary school is the school of the community and the latter always requires the services of rightly directed youths well trained in all branches of learning. Therefore, the curriculum must provide for varied types of courses according to the requirements of the community. Along with the demands of the community the needs of adolescents have also to be kept in view. Therefore, the secondary school curriculum must provide a variety of courses according to individual differences, otherwise it would fail to prepare the pupil for a vocation or the struggle for existence and also fail to supply the needed trained personnel to the country.

Secondary education begins to expose students to differentiated roles of science, the humanities and social sciences. This is also an appropriate stage to provide children with a sense of history and national perspective and gives them opportunities to understand their constitutional duties and rights to citizens. Conscious internationalization of a healthy work ethos and of the values of a humane and composite culture will be brought about through appropriately formulated curricula.

The Curriculum and Curriculum Development:

According to Vashist, S.R. any curriculum is developed on the basis of certain assumptions. For instance, it is quite natural for the curriculum designers to assume that a minimum essential level of physical facilities, adequate instructional time, well-qualified teachers and adequate number and suitable curriculum materials will be available

in all the schools. When the curriculum is defined to include all elements of experience, curriculum development becomes a complicated process. It is not sufficient, in making the curriculum, to shuffle courses, add or eliminate subject matter, or rearrange topics. Each of these activities may contribute at some point to the development of a well-conceived curriculum; but alone or in chance relationship they more often than not lead to confusion. An adequate curriculum can be developed only when all elements in the experience of the learner are considered, and when an orderly program is provided to assist the teacher in bringing these varied elements into suitable relationships. This is the task of curriculum development. It can be accomplished only through assistance from many workers and many fields of study, Philosophy, Sociology, Psychology and the subject matter fields must all be called upon for help. The materials from these fields, however, cannot be employed by an additive method. Each field contributes its share of materials – raw materials for curriculum making – but mere compilation by no means represents the process of curriculum development. The process is one of synthesis rather than compilation. This task is of organization or development of materials within particular cultural limitations. Thus, curriculum considered as a field of study represents no strictly limited body of content, but rather a process or procedure.

The country's system of curriculum development is based on national curricular framework which defines the core and other components which are flexible. The basic approach to curriculum design is based on National Curriculum Framework. The Framework is further elaborated into syllabus outlines stating aims and objectives of each areas

of curriculum. Based on the syllabus outlines textbooks are developed and other supplementary instructional materials are also brought out.

NCERT is a body that evolves consensus through seminars, workshops and conferences involving state level educational functionaries and concentrates in the formulation of frameworks.

Secondary Education:

Secondary Education starts with classes IX-X leading to the Higher Secondary classes of XI-XII. It serves as a bridge between elementary and higher education and prepares young persons between the age group of 14-18 years for entry into the world of work or for entry into higher education.

According to a reference Annual INDIA (2002) published by the Ministry of Information and Broadcasting, Govt. of India, the enrolment at Secondary/Senior Secondary stage increased from 1.5 million in 1950 to 27.8 million in 1998-99. Two third of the children's population still remains out of school system. There are about 1.10 lakh secondary level institutions to accommodate these children. Adolescents, which form the population for secondary education, continue to constitute nearly one fifth of the total population of the country.

Technology:

(i) the systematic scientific study of technique;

(ii) the application of science to the solution of practical problems;

(iii) a systematic body of facts and principles comprehensively organized for a practical purpose; may include the principles of effective teaching;

(iv) the science or systematic knowledge of the industrial arts, especially as applied to manufacturing;

(v) the material culture resulting from the combination of logic, mathematics and science.

Science Education:

Science education strengthens and develops in the child well defined activities and values such as the spirit of inquiry, creativity, objectivity, the courage to question, and an aesthetic sensibility.

Science education programmes enable the learner to acquire problem solving and decision making skills and to discover the relationship of science with health, agriculture, industry and other aspects of daily life.

(i) Education in natural science; education by means of which a person gains in ability to relate his experience with national events or things in such a manner as to make up, what is for him, a comprehensive and logically uniform system of thought or theoretic structure.

(ii) An area of professional education including facilities, curriculum, and teacher education as these relate to education in science.

Science education in schools is taught by teaching of science subjects like Physics, Chemistry and Biology. In 1965 CABE suggested

that increased provision should be made for the study of elective science courses. In 1961, i.e. third plan strengthened science teaching at the secondary level. The NCERT and Education Departments of different states have recommended 6-8 periods per week for the teaching of Science.

Science and Technology:

The word 'Science' is derived from the Latin root 'Seire' which means 'to know'. Thus the original meaning of science is simply 'knowledge', although it generally deals with natural and material phenomenon and is based mainly on observation, experiment and induction.

The word Technology is derived from the Greek root 'techno' meaning 'art', and is thus translated as science of Industrial Art. On the basis of these aforesaid definitions, while science is concerned with the fundamental knowledge of our world and its environment, technology deals with the numerous ways and means of pressing science into human services, of making or changing things for public ends.

Information Technology (IT):

IT in this study means use of computers. Ex: Multimedia is a means of constructing flexible and attractive teaching and learning resources that integrate text, pictures, animation, video and sound. 'IT' is pupil centred, unlike traditional didactic teaching, strategies for teaching IT will emphasize pupil-centred, resource based learning.

IT supports open, independent and flexible learning. This level of support will increase as hardware becomes cheaper and more portable. In the future, pupils might be expected to provide their own computer in the same way that they now bring other equipment to school. This computer would not be like the ones we are now used to, with the large screens, it could be a small, portable device used for entertainment as well as education.

Social Studies:

C.V. Good (Dictionary of Education) describes social studies as those portions of the subject matter of the social sciences, particularly History, Economics, Political Science, Sociology and Geography, which are regarded as suitable for study in elementary and secondary schools and are developed into courses of study, whether integrated or not, and of which both the subject matter and the aims are predominantly social; not to be confused with the social sciences or with subjects having a social aim but not social content (as in the case of courses in English, art appreciation, and personal health), nor to be confined to too narrow or rigid a combination of studies.

The present curriculum of social studies draws its subject matter from the disciplines of history, geography, civics and economics.

Opinion:

According to New Webster's dictionary an opinion is

(a) A judgement or belief that is stronger than an impression but less firm than positive knowledge.

(b) A judgement or impression of persons or things regarding their character or qualities.

(c) A commonly held attitude or sentiment.

(d) The official expression of a judgement by a qualified authority.

According to J.W. Best, "Opinion is that which people say about their beliefs and feelings."

In general opinion is the degree of +ve or -ve effect associated with some psychological object. By a psychological object means any symbol, phrase, slogan, person, institution, ideal or idea towards which people can differ with respect to +ve or -ve effect. In the literature of Psychology, the terms affect and feeling are used interchangeably. In individual who has associated +ve effect or feeling with some psychological object is said to like that object or to have a favourable opinion towards the object.

1.3.0 Delimitations of the Problem:

The various delimitations of the study are:

(i) There are many states in India but this study is confined only to U.P.

(ii) There are many cities, towns and villages in U.P. but this study is confined only to five cities of U.P. i.e., Agra, Allahabad, Aligarh, Bareilly and Lucknow.

(iii) There are many public, government-aided and government schools in the above mentioned five cities of U.P. but this study is confined only to 26 Senior Secondary Schools affiliated to Central Board of Secondary Education (CBSE) only.

(iv) There are many subjects being taught and evaluated in CBSE schools, but this study is confined only to evaluation and development of curriculum of Science, Social Studies and Information Technology.

(v) There are different classes, but this study is confined only to lower secondary and senior secondary classes i.e. class IX, X, XI and XII.

(vi) There are many people involved in the development and evaluation of curriculum, like curriculum Framers, Teacher Educators, Administrators, Students, their parents, teachers, Principals of school etc. but this study is confined only to collect the opinion of students and their teachers of science and social sciences at secondary school stage.

(vii) Various committees and seminars have been appointed in connection with the improvement of curriculum in science, social studies and Information Technology at secondary school level by the NCERT. But this study is confined only to the curriculum based on the National Curriculum Framework for School Education – 2000.

1.4.0 Conclusion:

The present chapter conceptualizes the problem, highlights its need, and defines the key terms vis-à-vis states the delimitations of the problem. This groundwork is very essential for making a well-directed attempt to investigate the research problem further.

CHAPTER 2

A REVIEW OF THE RELATED LITERATURE

2.0.0 Introduction:

Review of related literature allows the researcher to acquaint himself/herself with current knowledge in the field or area in which she/he is going to conduct his/her research. It serves the following specific purposes:

- It enables the researcher to define the limits of his/her field and helps in delimiting and defining his/her problem.
- It updates the knowledge of researcher and thus helps in stating the objectives clearly and concisely.
- By reviewing the related literature, the researcher can avoid unfruitful and useless problem areas. She/he can select those areas in which positive findings are very likely to result and his/her endeavours would be likely to add the knowledge in a meaningful way.
- Through the review of related literature, the researcher can avoid unintentional duplication of well established findings. It is no use to replicate a study when the stability and validity of its results have been clearly established.
- It gives the researcher an understanding of the research methodology which refers to the way the study is to be conducted. It helps the researcher to know about the tools and instruments which prove to be useful and promising in the previous studies. It provides an insight into the statistical methods through which validity of results is to be established.

- It helps in knowing about the recommendations of previous researchers listed in their studies for further research.

In nutshell, a thorough understanding of the nature of different related studies helps in conceptualizing the problem being studied and methodology adopted. Moreover, a meaningful collection of the relevant studies provides a direction to the task of researcher.

An attempt has been made in the present study to collect information from original theses. Where the theses were not available, the relevant information was collected from other reliable sources like educational journals. Some of the important journals used as sources were the Indian Educational Review, Journal of Educational Research and Extension, Research in Education, Journal on curricular studies etc.

The second survey of Research in Education by Buch, M.B., the Third, Fourth and Fifth survey of Research in Education by NCERT proved useful sources. The review has also been enriched by referring to various national and international dissertations and researches abstracts. For the purpose of surveying the related studies, various reliable institutional sources like Libraries of British Information Centre, Dr. Zakir Husain Library, Jamia Millia Islamia, New Delhi, University of Delhi, State Council for Educational Research and Training (SCERT), Lucknow, National Council for Educational Research and Training (NCERT) were visited.

The practice of organizing the main findings of related studies varies from researcher to researcher. Some investigators organize the reviews in chronological order. Others classify studies on the basis of

their findings. Yet others put the studies under review into broad divisions and follow either the chronological order or some principle related to the findings. This chapter, by and large, focuses on chronological order and put the studies into broad divisions like

(i) Studies done in India (ii) Studies done Abroad.

2.1.0 Studies done in India:

Gothiverekar, S.R. (1947) studied the Secondary School Curriculum in the Province of Bombay (A Critical Analysis and Examination of its Basis, Present Structure and Future Reconstruction).

The aims of the study were: (i) to study the objectives and principles underlying the secondary school curriculum in the Province of Bombay, and (ii) to suggest ways for the reconstruction of the curriculum based on a study of the working of the present curriculum.

The study was mainly confined to the Anglo-vernacular and vocational secondary schools in Bombay. The data were collected through survey of past and present curricula and syllabi in the Bombay Province. A sample survey was made in fifty five schools in Bombay city and six high schools as well as seven vocational high schools in Navasari. The questionnaire was sent to the principals of these sixty eight schools. The procedure included the analysis and evaluation of the present curricula of secondary schools in the Bombay Province, a critical review of each of the different curricula or syllabi, their comparative study and survey of the reports.

The main conclusions are: (i) due to political pressure, there is undue dominance of the English language since the advent of the British

rule to the present day; (ii) the undue importance given to the English language and to the matriculation examination has narrowed the purpose of secondary education; (iii) such subjects as drawing, art, craft, music, physical education, religious-cum-moral instruction, are neglected; (iv) due attention is not paid to practical and vocational education; and (v) undue emphasis is laid on English medium, consequently the mother tongue and the Indian languages are neglected. Some of the suggestions made are: (i) the aim of secondary education should be all sided development of an individual according to his needs, aptitudes and interests; (ii) domination of English should be minimized; (iii) undue importance of the matriculation examination should be minimized; (iv) the mother-tongue should be the medium of instruction; (v) practical and vocational education should be introduced; (vi) the curriculum should provide sufficient choice of subjects; and (vii) religious instruction should be included and physical education should be emphasized.

Pires, E.A. and Katyal, K. (1957) studied Building up a Social Studies Curriculum for the CIE Basic School.

The purposes of the study were: (i) to develop a social studies curriculum suitable for junior Basic classes; (ii) to demonstrate how Basic school teachers can and should develop their own curriculum; and (iii) to show how current events can be woven into the social studies curriculum at junior Basic stage.

The social studies curriculum was developed on the basis of items selected, based on daily experiences of the pupils and the important current events. The syllabus was chalked out for each week with help of teachers and pupils and put into practice. The work was done in each of

the four grades (II to V) in each week. An attempt was also made to evaluate the attainment of the pupils by administering specially constructed tests based on the syllabus covered.

The syllabus for the social studies for grades II to V for the CIE Basic school was developed. The specially constructed 'Social Studies Achievement Test' based on the syllabus covered, gave the scores ranging from twenty nine percent to eighty four percent for grade II, from thirty percent to eighty nine percent for grade III, from twenty two percent to seventy five percent for grade IV and from twenty six percent to eighty three percent for grade V.

The tests generally represent only the information part of the curriculum and do not attempt to cover all that has been done in the social studies. They exclude activities altogether.

Veerappa, N.S. (1958) studied Trends in Science Education.

The purpose of the study was to examine the present position of science education in India and to assess the new trends in the field, as observed in some of the advanced countries like U.S.A., U.K., etc. An attempt has also been made to interpret these trends with a view to finding how far they could be introduced in Indian institutions.

Schools, colleges of education and other institutions were visited. The programme of secondary institutions were visited. The programme of secondary education including the training of science teachers was also studied. To have a correct estimate of the British Secondary Education, the institutions selected for study included those which were situated in different parts of U.K. The new trends and directions in science education

were discussed with the teachers and the heads of the institutions. They were compared with the similar trends in U.S.A.

The major findings of the study were: (i) science education is introduced at the primary level and that general science has replaced nature study; (ii) the science course mainly consists of topics like food, air, water, atmosphere, and environment, etc; (iii) general science course at primary level has not been very popular due to lack of qualified teachers; (iv) the minimum qualification for a teacher at this level is matriculation with science subjects; (v) the courses in secondary schools generally include physics, chemistry and biology; (vi) the practical work in physics and chemistry is intended for the last two grades and that too, for only those who take science as an additional subject; (vii) the government secondary schools have better equipped laboratories than the other schools; (viii) the minimum qualification for a teacher in a secondary school is first university degree in science; (ix) the popular way of teaching science in secondary schools is Herbartian plan; (x) dividing science instruction into theory and practical is one of the reasons for the inefficiency; (xi) efforts are being made to procure and develop better teaching aids; (xii) teachers generally adopt lecture-demonstration method for teaching science; (xiii) few schools are having science clubs; (xiv) examination papers are generally loaded with essay type questions; (xv) instruction in science at intermediate level is far below the standard of the degree college level which is resulting in wastage; (xvi) the method of teaching at the degree college level is lecture-cum-practicals; and (xvii) equipment in the laboratories is either inadequate or of poor quality.

Chandrasekhariah, B.K. (1964) investigated into the basic vocabulary of elementary school children of standard I to VII of Mysore State.

The objective was to prepare a comprehensive basic graded vocabulary of about 4,000 to 5,000 words which could be understood by children in all parts of the state and which could be used as the basis for all reading programmes and the production of reading materials for children of primary standards I to VI in Mysore State. A preliminary list of 5,757 words was prepared from different sources such as: (i) departmental readers, I to VII; (ii) word list published by the Adult Education Council, Mysore; (iii) word list prepared by Sahitya Rachanalaya trainees; and (vi) miscellaneous. Two hundred primary school teachers, males and females, from urban, rural and slum areas were selected for judging the selection and grade-placement of words in the preliminary list. They included ten teachers from each of the twenty districts in the state.

After the analysis of the grade-placement of the words, 5,000 words were selected to prepare the comprehensive basic graded vocabulary. The allocation of the words in each standard was as follows standards I, II, III, and VI, 700 words each, standard IV 750 words, standard V 800 words, and standard VIII 650 words.

Dave, R.H. and Saxena, R.C. (1965) studied Curriculum and Teaching of Mathematics in the Higher Secondary Schools.

The objectives of this study were: (i) to study the existing curricula, textbooks and teaching methods in mathematics in higher

secondary schools of various states; and (ii) to develop a new curriculum in mathematics in the light of the experimental curriculum by adopting suitable techniques of teaching and learning. The analysis of syllabi and textbooks was extended to all states but the study of teaching-learning situations was confined to only four states, viz., Bihar, Gujarat, Mysore, and Punjab, and the Union Territory of Delhi. The study was confined to general mathematics course. For survey and analysis of the present syllabi in mathematics, Information Blank was prepared. For analysis of textbook, a questionnaire for teachers was prepared and mailed to 200 teachers, but only sixty were received duly completed. For study of the teaching-learning procedures, a questionnaire was given to students and classroom observations were made. Teachers were interviewed. Students in groups were also interviewed and general information blank was developed.

The major findings of the study were: (1) most syllabi did not specifically mention any objective of teaching mathematics; (2) even where these were recorded, consideration was given to (i) computational skills and abilities including knowledge of mathematical concepts, facts and principles, (ii) utility of mathematics, application of mathematical knowledge to solve everyday problems, select the relevant facts, reject the irrelevant ones, etc.; (3) in listing the content, all syllabi had followed the logical sequence of different mathematical processes; (4) the content was arranged under topics, further divided into subtopics; (5) basic concepts underlying the topics or subtopics had nowhere been indicated; (6) most syllabi did not define clearly the scope of a topic; (7) eleven percent of the authors had a doctoral degree and thirty seven percent

master's degree in the subject; (8) majority of the books were written in regional languages; (9) in about twenty five percent books, solved examples did not clarify the concepts; (10) in all books problems were provided but no book encouraged problem solving as a method of learning mathematics;(11) of the forty teachers observed during classroom teaching only fourteen usually linked a lesson with the premises; (12) in introducing a new topic, about ninety percent of the teachers talked about the subject and did not encourage pupils' participation; (13) not even fifty percent of the teachers ensured that the new concept had been learnt properly; (14) to a great extent the teachers depended on the text work for selection of problems; (15) about fifty percent of the teachers did analyse the problems on the day of observation; and (16) only about twenty six percent of the teachers corrected the home assignments with or without suggestions for improvement and majority of the teachers just signed the notebooks.

Chanana, P.S. (1967) conducted A Critical Study of the Development of the High School Curriculum in Punjab during the Twentieth Century.

This study inquires into the development of the high school curriculum in Punjab during the twentieth century.

The author makes the following observations. With the inception of British administration in Punjab after its annexation in 1849, there was a spontaneous enthusiasm for English education. Incentive to this was provided by the acceptance of the scheme of studies for the entrance examination of Calcutta University, the anxiety was felt on the part of the government to diffuse European knowledge among the people and

keenness for better social status and employment under the new regime. In consequence thereof, by 1869 the high school was a well defined institution in Punbjab.

The college, established in Lahore in 1870 was converted into a full fledged university in 1882 and the high school was given wider and better curriculum. At the close of nineteenth century Panjab University had approved a large number of courses with wide scope for choice that a high school student could have in India. There was provision for English, several classical and modern languages, mathematics, history and geography, physics and chemistry, botany and zoology, agriculture, drawing and commercial courses of shorthand, accountancy, book-keeping and correspondence. It was an undifferentiated curriculum drawn on the pattern of London Matriculation.

Lord Curzon's drive for qualitative improvement of education in the beginning of the present century had little impact on the high school curriculum in Punjab. Tied to the apron strings of the university, the high school continued to serve the college preparatory functions and the requirements of subordinate services in the state. It had no vocational bias and was dominated by English.

The period after the first world war witnessed in Punjab, an intellectual discontent with the traditional system of education. The unemployment among the educated and consciousness of the national pride led to the condemnation of narrow and transplanted curriculum. The National Education Movement inspired by the non-cooperation movement highlighted the weaknesses of the educational system and forced the government to admit that the discontent was genuine and that

the content of education must change in harmony with the changes in the social environment.

A survey of secondary education undertaken in 1923 at the instance of popular Ministry in Punjab revealed many weaknesses. The difficulties created by the merger of alternative courses of the high school in 1919 were referred to the school board of the university, but the procedural bottlenecks and general apathy to change delayed reforms for quite long. The twenties, however, saw the widening of the curriculum through the provision for extra-classroom activities and the introduction of the subjects of arithmetic and domestic economy, and civics and hygiene in 1927 and household accounts for girls in 1935. By this time, the processes of spelling out contents of subjects, started in 1906, was completed.

In forties of this century, there was a growing realization of the need for modernizing the curriculum of the high school. The changes contemplated in Britain's schools and conditions in India favoured changes in the high school programme, but the second world war and the political unrest in the country distracted the attention. Even recommendations of the reports of Abbot and Wood (1936) and the Central Advisory Board of Education (1944) were only thought of and not implemented.

The indifference on the part of the Britishers to vocationalising secondary education was in conformity with the tradition in their own country of keeping secondary schools as schools for general education. While the intelligentsia thought the vocationalisation of secondary education would lead to the creation of more work for employment and

less dependence on soft collared jobs, the general mass of people felt contented by giving their children the prevalent high school education for its social value and probable changes of employment. Emphasis upon English contrary to the advice of English and Indian educationists, neglect of the mother tongue and modern Indian languages, overcrowding of ill-defined contents of subjects, remoteness of studies from the social and economic circumstances, national outlook and aspirations on one hand, the nature and problems of the adolescents on the other, narrowed down the nature and scope of the high school curriculum in Punjab and made it ineffective and traditional subject-centered. The curriculum created among teachers an attitude of resistance to challenging learning experiences. The stereotyped training of teachers, the aversion of authorities to associate teachers in the task of framing curriculum, the helplessness of the spirited few at all levels of the hierarchy for qualitative improvement in the face of the persistent demand for more and more education, the rigidities, oddities and absurdities of the centralized administration of education, and the inability of the masses to judge the quality of education further worsened the situation. The lag between the life of the people and the school widened with time.

The School Board of the University, set up in 1920 to advise and guide in matters relating to the high school curriculum and examination, functioned perfunctorily. On account of its faulty composition and character and its limited powers, it was incapable of giving serious thought to the vital work of curriculum construction and system of the matriculation examination. The high school remained hitched to the

wagon of the university which was primarily concerned with higher education.

Inspite of the difficulties created by the partition of Punjab, things went sooner than expected. The schemes for the curriculum improvement devised in the state were, however, shelved with the publication of the Secondary Education Commission. Report intended to give a national plan of secondary education. The ambitious scheme of multipurpose higher secondary schools was launched in Punjab in 1958. The attempt to supplant the high school by the multipurpose higher secondary school, with its seven streams, has not succeeded, and the dissipation of resources has delayed the improvement of the high school curriculum. Reaction against past lapses and enthusiasm for change by themselves were not enough for ushering in a new era.

Pillai, K.S. (1968) Investigated into the Changes in the Content and Scope of the Primary and Secondary School Curriculum in Kerala during the last thirty years (Since 1934) with a view to ascertaining how far these have been helpful to the raising of standards..

The objectives were to find out whether the changes brought out during the last thirty year period were helpful for raising standards of education and if they are not adequate enough, to suggest steps which should improve standards further.

A comparison of the prescribed syllabi, question papers and examination systems, textbooks prescribed for study, administration reports and reports of the expert committees appointed from time to time in Kerala was made. Based on these findings as opinion survey was

conducted to elicit the views of teachers, heads of schools, administrators and educational experts regarding the various issues that might crop up.

Investigation revealed that schooling period in Kerala is of ten years, at the end of which is conducted a solitary external examination. Three language formula is in vogue in the schools with Malayalam as the medium of instruction since 1946. Its syllabus was revised in 1962, but people feel that there is still scope for improvement in it. English is taught as second language, its syllabus has been considerably reduced over years. Syllabus of Hindi which is taught as third language has been made heavier and in line with the expected standard. Standard of mathematics has been falling and its syllabus needs immediate revision to make it keep pace with the time. Practical bias and fusion programme are noteworthy features in general science. It appeared that in the light of aims and outcomes listed, the syllabus fulfilled the basic requirements as far as its contents are concerned. The question papers set in the examinations showed the extent of the content tested every year. It showed that the standard of achievement in English has fallen whereas that of Hindi risen and that of Malayalam remained more or less constant. Question paper coverage in mathematics was found to be exhaustive. The ability to discriminate between essential and non-essential and deep knowledge of subject matter were needed to score high in science subjects. Training in setting objective questions and improved scoring procedures were definitely going to help in raising the standards of examinations. Nationalized textbooks have been found cheaper and therefore accessible. Their preparation should be entrusted to the experts and these should be revised after every three years by committees of experts.

Kher, S.V. (1972) studied Critical Evaluation of History Textbook for standard VI.

The study was conducted with the purpose of evaluating the textbook used for teaching history to standard VI in Maharashtra and providing suitable recommendations for its improvement. The specific objectives. (i) to analyse the textbook with a view to finding out how far it helped in achieving the objectives of teaching history as mentioned in the presented syllabus, (ii) to find out whether the textbook was suited to the level of the understanding of the pupils of standard VI, (iii) to examine whether the text material promoted fearless quest for knowledge among the pupils, (iv) to find out the extent to which the textbook was helpful in creating an awareness of difference in values of the past and of the present, and (v) to ascertain whether the text material enabled the pupils to apply relevant lessons of history to their lives.

The method of research used for the study was the survey method. The tools used were questionnaires for teachers, parents and subject experts and group interviews with teachers, parents, experts and pupils.

The main findings and conclusions of the study were: (i) The textbook was helpful in creating among the pupils awareness of their social heritage and developing patriotism and emotional integration but was not helpful in creating international understanding and in interpreting the present in the light of the past history. (ii) All the topics in the syllabus were appropriately represented in the textbook. (iii) There were several mistakes in the text, several of them factual, errors of omission also appeared. (iv) The text material was easy to read and the biographical style of presentation was studied to the age of the pupils.

The book was attractive in visual aids as it contained a number of pictures, figures and maps. (vi) There was need for greater variety in the exercises so that all-objectives of history teaching could receive due weightage.

Pattabhiram, G. (1973) conductred An Evaluation of Nationalised Textbooks for Higher Classes in Social Studies in Secondary Schools of Andhra Pradesh. The objective of the study was to evaluate the nationalized textbooks in social studies, in order to locate their defects and deficiencies and to suggest remedial measures.

The evaluation of the textbooks was done with the cooperation of teachers, headmasters, pupils, teacher educators, administrators, and educational publishers. The characteristic features under study were: (i) the design and the lay out, (ii) the content, and (iii) the objectives to be attained by the pupils. Data were collected from different sources like, Andhra Pradesh government orders relating to nationalization of textbooks, educational reports from 1921 to 1958, the Central Bureau of Textbook Research, Ministry of Education and Social Welfare, and the Government of India. Views expressed in educational journals, periodicals and dailies were also analysed and studied.

The main findings of the study were: (i) all the nationalized textbooks were rated as satisfactory with regard to their mechanical characteristics, but there was room for improvement of design, stitching and wrapper; (ii) all the books, in general, had adequate content but readjustments in some units were necessary; (iii) the presentation of content was below average in the nationalized textbooks meant for class X; (iv) because of the ambiguity and vague presentation of matter, the

illustration in the textbooks for classes VIII through X were inadequate and below average; (v) inadequate assignments and exercises in the textbooks needed restructuring based on the objectives of the course; (vi) bibliography, unit references, and chapter summaries were not giving due and adequate weightage to current events; and (vii) the nationalized textbooks were better in quality and quantity as compared to old textbooks, but there was enough room for making qualitative improvement.

Ghosal, T. (1973) conducted An Inquiry into the Curricular Trend in the Secondary Schools of India during the British Rule: (a comparative study).

The objectives of the study were: (i) to test the validity of the educational system of the country which had always been, to some extent, the microcosm of the larger social system; and (ii) to analyse the curricular trends in secondary education in India in context with the developments in England. The study was chiefly based on library resources, authentic works on education in British India, reports and minutes of government officials. Critical study was made on: (i) indigenous Hindu and Muslim education in the first half of the nineteenth century; (ii) general assembly institution, Calcutta; (iii) Hindu Collegiate School; (iv) matriculation examination of the University of London; (v) entrance examination syllabus of the Calcutta University; (vi) entrance examination in Calcutta, Madras and Bombay; (vii) Rabindranath's School at Shantiniketan; and (viii) the National Council of Education.

The study revealed that (i) the secondary school curricula, both in India and England, had during the period of the inquiry, introduced

reforms as and when it needed an adjustment with the changes in the social, economic or political spheres; (ii) curricular reforms, when introduced gradually and at a lower pace, generally suited well with the system into which they were introduced, whereas quick and involuntary changes had an apparent risk of ignoring the interacting influences of many institutions which were closely connected with the reforms and whose impact on the intended reforms was immense; (iii) Indian secondary education at the end of the British rule was much the same as it was in 1904 and had changed a little from what it was in 1884; (iv) the reformers of Indian education studied foreign systems of education and tried to derive benefit from it, which resulted into a system unsuitable to the Indian situation; (v) the first quarter of the present century witnessed in India a reaction against the lowering down of the standard of the secondary education; and (vi) the secondary school in India had failed to deliver goods for the simple reason that its curriculum was an imitation of the British model without proper consideration of the social, economic or cultural context of the nation.

Shukla, G.B. (1975) carried out a Critical Study of Curriculum Development at the Stage of Elementary Education in the State of Gujarat: 1940-1970.

The major objectives of the investigation were: (i) to review the changes introduced in the curriculum of primary education during the years 1940-1970, (ii) to make a comparative study of the modifications introduced in the curriculum, (iii) to study critically the primary school curriculum introduced in Gujarat in 1967, (iv) to inquire into the factors responsible for the curriculum change, and (v) to evaluate the various

curricula of primary schools during the years 1940-1970. The investigation also developed a scheme of curriculum construction.

The sample consisted of teachers, headmasters, supervisors and teacher-educators selected from all the districts in the State. The sample included twenty-five headmasters, thirty teachers, ten supervisors from each district and sixty teacher-educators from ten primary teacher training colleges. The total number of respondents was 1184. The tools for data-collection were documents, questionnaires and interviews. The statistical techniques used were descriptive statistics.

The major findings of the investigation were: (i) The primary education curriculum was divided into two phases, for Classes I to IV and for Classes V to VIII. (ii) The major defects of the primary school curriculum were lack of practical knowledge, inadequate arithmetic in the lower classes, emphasis on information rather than understanding, a heavy load of subject matter, absence of moral education, low level of instruction in history, regional geography, the local trade, industry, etc., a curriculum devoid of flexibility and the like. (iii) The respondents felt an urgent need for a continuous programme of monitoring and evaluation of the curriculum. (iv) The need to undertake studies for improving teacher motivation was felt. (v) Teachers and teacher-educators felt a lack of involvement in the process of curriculum construction.

Singh, U.S. (1977) studied Development of a Curriculum in Science for Secondary Schools in the State of Maharashtra.

The objectives of the study were: (i) to evaluate the present science curriculum of standard VIII in vogue from 1972; (ii) to modify the

present curriculum with a view to achieving Skill Oriented Objectives of the teaching of science; and (iii) to finalise a practical and progressive science curriculum, after a tryout.

The existing science curriculum was evaluated by questionnaire and interviews. On the basis of the opinions of experienced and trained science teachers, the curriculum was modified and made more skill-oriented. Two groups of students of standard VIII of six English medium high schools in Bombay were selected for experimentation. The two groups were matched on the basis of achievement of the pupils in science in standard VII. The previous knowledge of the two groups was measured by a pretest based on the curriculum of standard VIII. The modified curriculum was taught to the experimental group and the existing curriculum was taught to the control group. After teaching both the curricula, a posttest was administered to both the groups. Significance of the difference between means was computed.

The major findings of the study were: (i) significant difference between the means of achievement in knowledge objective was found in three out of six schools; (ii) significant difference between the means of achievement in skill objective was found in all the schools; and (iii) significant difference between the means of achievement in application objective was found in five out of the six schools. The investigator concluded that the curriculum suggested was more suitable than the existing curriculum and that the existing science curriculum in force in the State needed modification.

Gopalakrishnan, K.R. (1977) studied Critical Analysis of the New Mathematics Syllabus and Textbooks Used in the Upper Primary Classes in Kerala.

The main objectives of the investigation were: (i) to find out how far the syllabus prescribed in mathematics was adequate in the light of the main qualities expected of textbooks, (ii) to find out the constraints that affect the implementation of the current syllabus, (iii) to attempt a comparative study of the current syllabus (1970-73) with that of the immediately preceding years, (iv) to locate areas or topics to be deleted from and/or added to the syllabus under study, and (v) to find out how the syllabus in mathematics prescribed for the Kerala schools was comparable with that of advanced countries.

The main tools used in the study were questionnaire and interviews. A sample of 1,500 teachers from 250 schools was selected for the study. Interviews were carried out with a selected number of parents, students, educational experts and teachers.

The major findings of the investigation were: (i) Predetermined percentage of promotion, over-crowding in classrooms, low socio-economic status of the parents, frequent strikes and agitations, poor academic background of students, lack of adequate foundation in mathematics, lack of parental interest, lack of interest on the part of the students and lack of textbooks dominated among the causes that adversely affected the introduction of new mathematics. (ii) The structure and rigour of the mathematics textbooks were appropriate. The rate of introduction of new terms was uneven. Typographical errors, errors due to carelessness and real errors were found here and there in the textbooks.

Almost all topics needed gradation. The revision exercises, diagnostic tests and general exercises were, in general, appropriate. The inclusion of enrichment programmes was a good feature of the textbooks but the diagrams were not satisfactory. There was some disagreement between the syllabus and the textbooks due to omission of certain topics and sub-units. (iii) The syllabus of 1970-73 was better than that of the immediately preceding years. (iv) The coverage of content of textbooks of Kerala was not at par with that of the SMSG and the SMP series; the Kerala syllabus differed from even the NCERT syllabus. (v) The additions to the syllabus suggested by the respondents were more exercises suitable for homework, problems related to life, English equivalents of new terms and life history and important events of mathematicians. The deletions suggested included discovering patterns, enrichment programmes, difficult problems and fundamental laws.

Chaudhari, I.S. (1977) conducted A Critical Evaluation of School Textbook Improvement Programmes in India.

The objectives of the study were: (i) to assess the nature and extent of improvement in textbooks that the textbook improvement programme has brought about; (ii) to reveal the bottlenecks and hidden malpractices in the way of textbooks improvement; (iii) to assess the efforts of various textbooks agencies in writing, publication, production and revision of textbooks; and (iv) to determine the value of existing textbook improvement programmes with a view to making these programmes more fruitful and productive. The evaluation criteria for testing the textbook improvement programme included worthwhileness, relevancy, adequacy,

definiteness, specificity, practicability, consistency, objectivity and interpretiveness.

Both historical method and survey method were used in the study. For the historical method the sources of data were reports of various commissions and committees set up by the central and the state governments, reports of textbook nationalization agencies in the state, relevant publications on the textbooks produced by NCERT, NBST and private publishers, survey conducted on textbooks in Japan, USA, etc., articles in magazines and research monographs, investigator's personal experience in attending conferences, seminars and workshops, reviews appearing in daily newspapers, magazines, and journals. For the survey part a representative sample of 198 was drawn to cover all important subjects, classes and the states. The sample textbooks included both nationalized and non-nationalised books. For evaluating the textbooks, an evaluation instrument of 100 statements was constructed. The tool was validated against pupil achievement.

It was found that existing tools and techniques of textbook evaluation were based on such principles, theories, approaches and criteria which were selection oriented and not improvement oriented. Even agencies like CBTR, NCERT and NBST had not contributed much to this effect. Deficiencies were there in the aspects of textbook content, organization, presentation, language, illustration exercises and other aspects. These deficiencies were reflected in the ratings or scores, but these were accepted as such before the books were prescribed. This only meant that in spite of evaluation, substandard textbooks were in vogue. This was only because tools and techniques of evaluation for selection

did not contain inbuilt provisions for improvement before approval. From the survey of textbooks it was found that (i) all nationalized textbooks were written strictly according to prescribed syllabus; (ii) answers in some mathematics textbooks, maps in geography textbooks, and certain facts in science textbooks were erroneous of serious nature; (iii) latest approach in content presentation were perceptible in some books produced by NCERT; (iv) illustrations were the best features in some English textbooks, but mathematics textbooks suffered much due to poor illustrations; (vi) syllabus, objectives, and bibliography were usually absent in nationalized textbooks; and (vii) on the whole, books used in English medium public/convent/anglo-Indian schools were rated high, whereas the nationalized books and those produced by reputed publishers were, by and large, rated as of medium quality with respect to content, language, illustrations, exercises, printing, paper, binding and pricing.

Uppal, S.S. (1977) studied Development of Curriculum in Science for Secondary Schools in the State of Maharashtra

The objective of the study was to develop a curriculum in science for standard VIII of the secondary schools in the state of Maharashtra. Data were collected by means of a questionnaire administered to science teachers and by conducting an experiment on pupils of standard VIII of English-medium schools.

The main findings of the study were: (i) The existing syllabus in force in the state needed modification. (ii) The syllabus suggested by the investigator was effective.

Dewasthalee, R.B. (1978) conducted An Investigation into the Present Secondary Education Curricula (Std. V to X) in the Maharashtra State with a view to revision in the Context of Vocationalisation of Education at all levels.

The important objectives of the study were: (i) to investigate the nature, degree and extent of vocationalisation achieved through the present secondary education curricula; (ii) to locate different areas in which vocationalisation can be achieved; and (iii) to frame syllabi of different vocationalised courses in different areas that can be introduced at all levels of secondary education.

Two main methods of the study were: (i) survey of vocationalisation achieved, which was descriptive in nature, and (ii) the construction of new syllabi of vocational courses suitable to secondary school children. The techniques used for data collection were (a) interviews, (b) observation of teaching, and (c) visits to vocational and industrial institutions.

The main conclusions and recommendations of the study were as follows: (i) The academic atmosphere was in favour of vocationalisation. (ii) Vocational education should begin from standard V. (iii) Some vocational courses should be introduced for the dropouts. (iv) Vocational courses should not be treated as 'extra'. (v) A pupil must be given a certificate for successfully completing a vocational course. (vi) In vocational courses emphasis should be on practical aspects. (vii) A comprehensive programme of vocational guidance is essential. (viii) A common vocational school should be set up to meet the needs of various neighbouring schools.

Sali, V.Z. (1978) investigated into the Difficulties in Implementing New Curriculum of the Secondary Schools and Remedies for It – a Critical Study.

The investigation was conducted with the main purposes of (i) studying subject-wise difficulties while implementing new curriculum of secondary schools and suggesting remedies for them, and (ii) studying the reasons of poor results at the school-leaving examinations.

The study included twelve secondary schools of Kolhapur district as the sample. Along with some factual information, the view-points of teachers, guardians, principals, education officers, teacher associations and students were collected. The questionnaire, interview, record survey, discussion and observation techniques were used for the conduct of the study. The descriptive approach was used for the analysis of data.

The investigation revealed: (i) Mathematics was considered the most difficult subject for teachers and students along with science and English; when more care was taken for teaching these difficult subjects, the teaching of Marathi and social sciences was neglected. (ii) It was difficult to supplement new curriculum in the schools lacking physical facilities like buildings, laboratories, libraries, etc. (iii) Non-availability of enough teachers from the educational departments, lack of preparation on the part of teachers, 'teachers' lack of understanding the objectives of the curriculum, lack of motivation of teachers for conducting research, negligence in school inspection and guidance by administrative authorities, insufficient management of in-service training, lack of proper guidance by parents and their poor economic background, were barriers in the implementation of the new curriculum. (iv) Suggestions for

improvement of in-service teacher education programmes, efficient administration and supervision of schools, implementation of school complex programmes, research on secondary education, etc., were provided.

Tharyani, D.K. (1978) carried out a Critical Study of the Effectiveness of the Revised Curriculum for Classes VIII, IX and in Maharashtra State.

The main objectives of the study were: (i) to examine the various measures taken by the Government of Maharashtra for the effective implementation of the new curriculum in Classes VIII, IX and X, (ii) to look at the existing facilities in both the rural and the urban schools in the State for effective implementation of the new curriculum, and (iii) to find out the difficulties experienced by schools in implementing the new curriculum.

The methodology used for the study was the normative survey method. The technique of sampling used was stratified purposive technique. The tools used for data collection were the questionnaire and the interview schedule.

The major findings of the study were: (i) A large number of schools, especially those in the rural areas, were not self-sufficient. (ii) The necessary resources in the form of funds, space and materials and equipment were not available in most of the schools for bringing about the effective changes required by the new curriculum. (iii) The new curriculum was out of tune with the social, economic, philosophical, psychological and educational requirements of the students and society.

(iv) The programmes of work experience and social service included in the new curriculum were not properly integrated with the programme of general education. (v) The compulsory teaching of the subjects of mathematics, science and English introduced in the new curriculum was responsible for a large number of failures at the Secondary School Certificate Examination. (vi) The efforts made by the Government of Maharashtra for the effective implementation of the new curriculum proved ineffective due to lack of funds, lack of coordination, inconsistent changes and bureaucratic and mechanical procedures of the State Department of Education.

Ghorai, I. (1980) conducted a research study on the new curriculum of Secondary Education (in West Bengal in the Light of Curricular History), The main aim of the study was to know the views and opinions of teachers and the taught on the efficacy of the new secondary curriculum, Madhyamik as it was called in West Bengal, and to find out the relation between teaching at secondary level and learning the same content by students.

Twelve hundred teachers and five hundred students of one hundred selected schools of West Bengal were selected on the basis of location as rural, urban and industrial areas. The questionnaire technique was used. Opinions of secondary teachers of West Bengal were collected. Opinions of secondary students of West Bengal were also collected regarding their learning. To estimate the relationship between teachers' opinion and students' opinion, correlation coefficient was calculated.

The major findings of the study were: (i) Most of the teachers (51.16 percent) felt that secondary curriculum was quite heavy in its

content and lacked balance. (ii) A section of teachers (21.39 percent) felt teaching aids and equipments should be provided to teachers for better teaching. (iii) Teachers (37.21 percent) felt that spiritual education, moral education, hygiene and sex education should be included in the curriculum. (iv) A section of teachers (23.25 percent) thought the syllabus for work education should be modified. (v) In English, out of thirty-four items, only in one item there was association between teaching and learning; students learnt what teachers taught. (vi). In Mathematics, out of twenty-four items students agreed with their teachers only on one item. (vii) Out of thirty-two items of physical science only for one item teachers' and students' opinions were the same. (viii) In life science, out of twenty-six items, for four items students agreed with their teachers. (ix) In geography, out of thirty-two items for five items there was association between teaching and learning. (x) In history, out of thirty two items only on four items students agreed with their teachers. (xi) Out of twelve items of physical education, students agreed with their teachers on one item. (xii) Opinions of students were different from those of their teachers on some items of different subjects.

Muttaqi, I.A. (1981) studied development of a curriculum in Biology for Secondary Schools of Bangladesh.

The general objective of the study was to develop an ecology curriculum which was suitable and effective in developing environmental literacy among the students of Grades VI, VII and VIII of some selected schools of Bangladesh. The study was both a developmental and an evaluative research. The first phase of the study consisted of the development of curriculum, curricular materials and their preliminary and

formative evaluation. The second phase of the study comprised summative evaluation or evaluation of the developed materials in the real classroom situations.

The design of the study necessitated sampling in two phases, for the formative evaluation and for the summative evaluation. For formative evaluation the samples drawn were subject specialists (four), curriculum specialists (four), classroom teachers (twelve), head masters (four), textbook writers (three) and parents (twelve) whereas for summative evaluation two urban and two rural schools, twelve classroom science teachers, and 552 boys and girls of Grades VI, VII and VIII were selected. The experimental treatment for the teachers consisted of teachers' orientation programmes, through discussion of content of the students' materials and the use of the teachers' manual.

The major findings of the study were: (i) In the formative evaluation, the curriculum and the curricular materials were found suitable and appropriate for the purpose of the study. (ii) The curricular materials were effective in producing significant gain in knowledge of the students about ecological facts, principles, information and the related problems as well as their possible solution. (iii) The curricular materials were effective in producing significant changes in the attitudes of the students towards environment in the majority of the grades. (iv) The teachers' manual was effective in producing significant positive changes in the attitudes of teachers. (v) The teachers' manual was effective in producing significant gains in knowledge of teachers about ecological facts and related problems with possible solutions. (vi) There was low correlation between the gain in ecological knowledge and the change in

attitude towards environment. (vii) Rural students possessed significantly less ecological knowledge. (viii) In the majority of the grades the difference between the rural and the urban boys in respect of knowledge in ecology was significant, the knowledge in ecology of urban boys was greater. (ix) There was significant difference between the rural and the urban girls in respect of ecological knowledge, the urban girls possessed more ecological knowledge. (x) The difference in attitudes towards environment between the rural and the urban girls was significant in the majority of the grades; the urban girls possessed more favourable attitudes in the majority of the grades.

Ramdas, J. (1981) studied Curriculum Development in Science relevant to the Indian School System.

The objectives of the study were: (i) to formulate operational objectives to be achieved by science teachers in the classroom, (ii) to implement these objectives and to evaluate their effectiveness in terms of changes in teacher and pupil behaviour, and (iii) to develop and test strategies for curriculum change which would be suitable for Indian conditions.

Two experiments were conducted under this study. One was carried out with general science curriculum for Standards I to VII in fifteen primary schools situated in a rural area near Khiroda in Jalgaon district in Maharashtra. The other was carried out with physics curriculum in Standard IX in fifty selected secondary schools of the Bombay Municipal Corporation. The experiments were designed to demonstrate that without altering syllabus, textbooks and other material conditions in the schools, and only with some training inputs to the

teachers, science teaching could be improved. Experimental and control groups were used for the study. In both the experiments, the teachers were given orientation in objective-based teaching strategies and more participatory teaching styles. Handbooks were prepared for teachers' use. The experiment in the primary schools used a systematic observation sheet for observing classroom behaviour and an interview schedule for the teachers. In addition, attendance record and examination marks were used for evaluating the outcomes of the experiment. In the secondary schools written tests were prepared specially for the purpose.

The study led to some broad generalizations. The comparison of the control and the experimental groups revealed: (i) Teachers showed some significant changes such as willingness to change their teaching methods and go beyond the textual material to include real life experiences and to encourage participation of pupils. (ii) An improvement in the pupils' ability to apply concepts in physics to non-textual situations was also observed. (iii) There was no difference in the use of novel ideas of the experimental and the control groups. Pupils in the experimental group contributed more to discussions in the classroom; however, improvement of pupils in the skill of experimentation and other group activities was not significantly different in the two groups compared. (iv) Suggestions were made to pay more attention to the actual process of education in the classroom and bring about a conceptual change in its role, to study in the field actual effectiveness of the curricula, and to adapt teaching methods and curricula to the changing needs of society.

Sharma, Y.K. (1982) studied Growth and Development of Science Education in Bihar.

tive of the study was to analyse the aims, curriculum, tex ... niques, materials and equipment, teacher training progra ... supervision and inspection, and agencies for the improvement of science education in Bihar.

The population of the study consisted of all the schools, primary as well as secondary, of Bihar and other institutions connected with science education at the school stage. Data were collected from ten primary schools, ten middle schools, ten secondary schools and the State Council for Educational Research and Training. Five science teacher-educators of secondary education colleges and ten science teacher-educators of primary teacher education colleges were interviewed with the help of a specially prepared interview schedule.

At the time of the study the State Government was making attempts to reorganize the educational structure on the 10+2+3 pattern. As a result, curricula, textbooks, methods, teacher education programmes and process of evaluation were being revised. It was emphasized that while science education had largely expanded during the last decade, the administrative bodies and methods had remained more or less unchanged. Thus, there was need for modernizing and strengthening administration in the field of science education. There was also an urgent need for exploring the possibilities of using modern approaches and devices which were being adopted in advanced countries for the teaching of science so as to maximize the performance of teachers and students in teaching and learning science.

Karim, P.I.A. (1982) conducted An Analysis of the contents of the History Textbooks followed in Kerala Schools with a view to Developing Models and Materials for National Integration.

The study was intended to analyse the history textbooks prescribed for standards VIII, IX and X in Kerala to assess the extent to which they promoted national integration.

The textbooks were analysed to identify instances which would hinder promotion of national integration classified under obscurantism, communalism and regionalism and instances which would promote national integration.

It was found that while instances of obscurantism, communalism and regionalism were rare, the content of the textbooks was consciously intended to promote national integration.

Rai, U.C. (1982) conducted a study of objectives, courses and methods of teaching followed at the undergraduate level social sciences.

The major objectives of the study were: (i) to find out the extent to which the general and specific objectives were realized through the teaching of social sciences at the B.A. level, (ii) to find out the relevant general as well as specific objectives in teaching social sciences, (iii) to find out the items of study prescribed in social sciences for realizing general objectives and their relevance, (iv) to find out the items prescribed for realizing specific objectives and the extent to which they were essential for realizing these objectives in the teaching of social sciences, (v) to find out whether the organization of courses in social sciences was acceptable to students and teachers of social sciences, (vi) to

find out methods/techniques/teaching aids used at the B.A. level for the teaching of social sciences, and (vii) to find out whether these techniques and tools were useful in the opinion of parents, teachers and students.

A sample of 135 teachers and 191 students was drawn from four universities, viz. Banaras Hindu University, Kashi Vidyapeeth, and Allahabad and Gorakhpur Universities, working or studying in the postgraduate departments of history, political science, sociology, economics and psychology. The tool used was a questionnaire prepared by the investigator. The data were analysed by employing percentages, chi-square test and t-test.

The major findings of the study were: (i) None of the general objectives was being realized by the courses and methods of social sciences at the undergraduate level. (ii) All the sixteen general objectives were considered relevant by a large majority of the respondents. (iii) There was no significant difference in the perception of students and teachers about the relevance of the objectives except the two objectives, viz., to enable students to be mature and sensitive to the world around them and to inculcate in them a commitment to society through involvement in nation-building programmes. (iv) The specific objectives of teaching history, political science, sociology, economics and psychology were not being realized fully but all of them were considered useful and essential by a large majority of the respondents. (v) In the core courses, about 50 per cent items were prescribed but all the items were considered relevant and useful by a significant majority of the respondents. (vi) Items mentioned for applied studies in all the branches of social sciences were not prescribed in any one of them but were

perceived as essential and useful by the respondents. (vii) Items mentioned for being prescribed in extension programme of social science courses were not prescribed in any of the subjects but were claimed to be essential and useful by the respondents. (viii) All the five subject groups agreed with the organization of courses into foundation, core, and applied courhools in extension programmes. There was no significant difference in the perception of teachers and students regarding the organization of courses. (ix) Lecture method was the only method which claimed to be used daily by 93.87 per cent followed by dictation, which claimed to be used daily by 28.15 per cent of respondents. (x) Tutorial, lecture-cum-assignment, problem-solving, group discussion and seminar methods were considered highly useful whereas individual library work, experimental method, multimedia approach and programmed instruction were not considered useful by a majority of the respondents. (xi) Charts, films, maps, models and cyclostyled materials were considered more useful than other ones but in the opinion of a large majority of the students and the teachers; teaching aids were generally not used.

Basu, B. (1983) Curricula prescribed by the Board of Secondary Education for the High School Level: An Analysis in relation to the promotion of National Integration.

The objective of the study was to analyse the curriculum in relation to promotion of national integration. The hypotheses framed were: (1) When the standard and quality of education are controlled at the national level, the syllabi prescribed by different boards of secondary education give almost the same emphasis to the objective of promotion of national integration. (2) When the teachers possess a positive attitude towards

national integration through education, it affects the students positively. (3) When the schools function as an effective medium to promote integrated feeling, there will not be any variation among the students in attainment of the same. (4) If the existing administrative facilities have an impact on the attainment of educational goals, schools under different managements vary in the attainment of the objective of the promotion of national integration. (5) If the socio-economic background has any effect on the promotion of integrated feeling among the individuals, there will be variation among the rural and urban schools in their attainment of goals. (6) When a common syllabus is given to the school on a compulsory basis, but the implementation part varies from institution to institution, students achieve emotional integration more at the cognitive level than at the affective level.

The sample for the study consisted of 100 eminent educationists, 20 judges to judge the syllabus, 100 teachers of schools and 100 students. The tools used in the study were: (i) An opinionnaire for the educationists. This consisted of items relating to knowledge, understanding and application objectives. It was a three-point scale for judging the curricula about national integration keeping in mind cognitive level objectives. (ii) The Syllabus Analysis Schedule was used to get the opinion of the judges about the elements of national integration in the syllabus. (iii) A questionnaire for teachers to explore their attitude about national integration through education. (iv) The Situated Test for students constructed on the basis of ten elements of national integration. Its split-half reliability was 0.88 and validity against teacher attitude criterion was 0.66.

The findings of the study were: (1) All syllabi prescribed by different boards of education emphasized almost all elements of national integration. (2) All sample teachers taken together, indicated that they were equally distributed in their positive and highly positive attitude towards the promotion of national integration. (3) There was no significant difference in the percentage of male and female teachers within 35 years of age and teachers above 35 years of age in their positive attitude. The teachers irrespective of their sex had a positive attitude towards the promotion of national integration. (4) The scores obtained about various activities going on in the school showed a variation. This indicated that the activities were implemented with differing emphasis in schools depending on management. (5) There was no significant difference between the scores of boys and girls in integrated feeling. (6) The students scored more in integrated feeling at the cognitive level than at the affective level. (7) The students following the Central Board of Secondary Education syllabus scored more on the situated test than the students following the State Board of Secondary Education syllabus. (8) The urban students scored more than the rural students in integrated feelings. (9) There was no positive correlation between the attitude of teachers, activities being implemented in the schools and the development of integrated feeling among the students.

Paul Choudhury, R. (1983) studied change in the Courses of Studies in Secondary Education of Nagaland.

The main aim of the study was to find out the desirable course contents in mathematics for the students of grades V to VIII in Nagaland

and to assess how far the course contents under the existing syllabi of Nagaland were effective.

The study was divided into three parts, viz., (i) comparison of objectives of mathematics education in the light of Bloom's taxonomy, (ii) comparison of course contents of various mathematics syllabi, and (iii) evaluation of effectiveness of the mathematics syllabi adopted in Nagaland schools. The final sample (N=2003) was selected from grades V to VIII of ten high schools covering all the seven districts of Nagaland by adopting the stratified random sampling technique. A General Mathematics Assessment Test (GMAT) was constructed and standardized for classes V through VIII separately. Syllabi of mathematics of the north-eastern states, NCERT, Central Schools and School Mathematics Study Group were examined for enabling a comparison of the subject contents. School examination marks were used for computing correlation between the GMAT scores and the school achievements.

The major findings were: (1) The GMAT was reliable and valid. (2) The quantum of the subject matter prescribed in the existing syllabus was too heavy. (3) In as many as five common items of GMAT, the gradient curves of V to VIII were almost horizontal. (4) Bloom's taxonomy omitted the vital ingredient in mathematics education – the development of imaginative understanding. (5) The Central Schools had the most advanced syllabus. The syllabus of the NCERT was superior to all other syllabi of the north-eastern states. Nagaland had very recently adopted the NCERT syllabus, and so it was evident that a wide gap existed between the 'past' and the 'present'. (6) The examination of the effectiveness of the NCERT syllabus in Nagaland schools, which was

undertaken through administration of GMAT on a random sample of schools of the state, revealed that the students of classes V to VIII failed to recognize mathematical structures or patterns. Boys performed better than girls but the difference in performance was not always significant. (7) The statements of objectives developed by the NCERT and the north-eastern states of India were in conformity with the goals of mathematics education. But the statements were not supplemented with spelling out of work activities in order to be really effective. NCERT and the Central Schools had emphasized the structure of mathematics in organizing the subject matter. (8) There was nothing which could be called completely new in mathematics. There had been a shift of emphasis from manipulation skills to conceptual learning. (9) The practical values of the outline of contents so prepared were examined and it was found that this formed as essential part of usable mathematics.

The significant educational implication was that the study proposed to bring about a worthwhile change in the course of studies in mathematics for classes V to VIII of the schools in Nagaland.

Dani, D.N. (1984) investigated into the Scientific Attitude and Cognitive Styles of higher secondary students. The specific objectives of the study were:

i) To measure the scientific attitude of higher secondary students.

ii) To find out the cognitive styles of higher secondary students.

iii) To compare the scientific attitude and cognitive styles of boys and girls of villages, town and city pupils, science, arts and commerce students.

iv) To compare the scientific attitude and cognitive styles of early adolescent, middle and late adolescent students.

v) To investigate the relationship between scientific attitude and cognitive styles of higher secondary students.

Sample consisted of 804 boys and 416 girls selected by stratified cluster sampling and by purposive sampling techniques. The sample was selected from the total of 48 schools from cities, towns and villages. For cognitive styles, 505 students out of 1265 were selected at random.

Tools used were scientific attitude study (SAS) constructed by the investigator and group embedded figures tests by Ottman, Raskim and Witkis. The method employed for the study was a combination of the normative, correlational and comparative survey method. For analysis of the data and drawing of conclusion analysis of variance, regression and factor analysis were used.

The findings were (i) About 80% of the students had a positive scientific attitude (ii) Boys and girls did not differ in scientific attitude scores (iii) Scientific attitude of students of science was higher than that of arts and commerce students (iv) the rural students were found to have a low level of Scientific Attitude as compared to urban students (v) The Scientific Attitude decreased significantly with an increase in age (vi) About 71% of students were clearly field-dependents.

Pande, P. (1984) conducted an Analytical Study and Development of Secondary School Curriculum in Maharashtra.

The main objectives of the study were (i) to find out whether the curriculum was rational and/or traditional in scope, (ii) to find out

whether the curriculum was of practical utility for the students in particular and society in general, (iii) to find out whether the curriculum was flexible, (iv) to find out whether the curriculum had enough variety to allow for individual differences in terms of abilities, interests and needs, (v) to find out whether the curriculum was integrated at all levels – primary, secondary and university, (vi) to find out whether the curriculum was rich enough to meet the new demands, (vii) to find out whether the curriculum was dominated by a system of examination, (viii) to find out whether the curriculum was able to fulfill the aims of secondary education, (ix) to find out whether the language curriculum built the personality of the students, (x) to find out whether the curriculum of social studies developed democratic citizenship among the school students, (xi) to find out whether the curriculum of science built up personality, and (xii) to find whether the curriculum of mathematics improved vocational efficiency.

Data were collected by administering an opinionnaire constructed by the researcher to a sample of (i) experts, (ii) heads of secondary schools, (iii) teachers of secondary schools, (iv) guardians and (v) students studying in different faculties of education chosen from all over the state of Maharashtra. It was a normative survey kind of research.

The following were some of the findings: (1) The consensus of the experts, heads of schools, teachers, guardians and students was that the curriculum was rational in scope. (2) More than two-thirds of the members of all the groups thought that the curriculum was traditional. (3) Only half of the persons from all the groups thought that the curriculum was of utility to the students in particular and to society in general. (4)

Opinion seemed equally divided on the point that the curriculum had to be flexible. (5) Nearly half of the persons from different categories agreed that the curriculum had enough variety to allow for individual differences in terms of abilities, interests and needs. (6) Half of the total persons, mostly teachers, agreed that the curriculum was integrated at all levels – primary, secondary and university. (7) Experts disagreed with the statement that the present curriculum prepared the pupils for the next stage of education.

Dr. T.N. Das (1988) conducted a study on the Axioms in curriculum planning. According to him curriculum development, at present engages the attention of educationists throughout the world to face the desired social, economic, political, technical and moral changes. Due to the military rivalry between the two existing political blocs in the world arena, changes at present are needed more hastily than in the previous decades. In order to refine man's internal world and his environment, and above all to develop his fullness, curriculum is an indispensable tool. The investigator focused on the curricular trends both in India and abroad. He proposed eleven axioms of curriculum development which were as follows:

i) Management of conflict is a pre-condition for securing cooperation.

ii) Since curriculum planning has to be related to the educational system as a whole, it is necessary to determine the state of the system.

iii) Curriculum planning needs to be carried out as a combined operation. The school teachers are the true custodians of the curriculum.

iv) If it is to be effective, curriculum planning must be accompanied by appropriate learning materials.

v) In curriculum planning, emphasis is gradually shifting from the teacher as instructor to the teacher as manager of learning situations.

vi) In curriculum planning selection of objectives come before selection of concepts.

vii) Continuous assessment and evaluation must be built into curriculum planning to ensure that it is self correcting.

viii) In all education systems the major forces for change stem from outside.

ix) In most curriculum projects, there is an inherent tendency to under-estimate the learning capacities of the average child.

The above 11 axioms of curriculum development are the emergent guidelines for curriculum development.

Aejaz Masih (1990) studied Scientific Literary: Paramount Criterion for Evaluation of School Science Curriculum. He proposes that one of the major objectives of teaching science at the school level is to develop a scientifically literate person. After analyzing the various learning outcomes, the investigator concluded that the present system of science education has failed to fulfill the objectives of science teaching.

Two contributors to this failure, as identified by the author are, curriculum implementation and rigid examination system. The author, therefore, calls for serious and coordinated efforts to improve the existing science teaching – learning process in schools. He concludes that at present our entire educational process is examination dominated, and it is not likely to change in near future. Therefore, he suggests that the only possible solution is to introduce some revolutionary changes in the system of evaluation itself. Such changes would compel one to change the teaching – learning strategies and ultimately provide a better environment for proper learning experiences.

Vijaykumar, B.S. (1990) studied on development of optimal models of chemistry curricula at collegiate level. Models of chemistry curricula were selected, adopted and evolved and finally tested in order to determine the optimal models. 564 students (rural = 279, urban = 285; male = 260 and female = 304) and 315 teachers drawn from 10 colleges participated in the study. Vijaykumar, found the Inquiry Training Model the most effective, and the advance organizer, the least effective. Effectiveness of the models of chemistry curricula was established on the basis of various dimensions responded to by teachers as well as students.

Rao, S.K.'s (1992) study on 'Structural Influence on Restructuring of Curriculum' was sponsored by the Council of International Educational Studies, Washington D.C. The threefold objectives of the study were to (a) identify structural factors that influence restructuring of curriculum (b) analyse relationship between structural factors and curriculum changes; and (c) suggest planning and managerial strategies for restructuring curriculum at undergraduate level. Besides documentary

analysis, the researcher conducted interviews with students, teachers and administrators of various levels from three institutions of a university, a liberal arts college and a community college. Rao, found that large size of institution, private management bodies, periodic recruitment of new faculty members, location near institution known for restructuring of curricula, innovator status of the institution and larger no. of persons involved in restructuring facilitate curriculum restructuring. It was highlighted by the researcher that restructuring curricula is not purely an academic exercise, it has administrative and political aspects too.

Om Vikas (1997) conducted a case study on Information Technology.

The investigator discussed the issues and prospects of structured vocational education with vertical linkage from the secondary school to degree level programmes while illustrating some of the foreign models of industry attachment. The author has touched upon some of the problems in pursuing vocationalization. Further, he has proposed a curriculum framework for the degree level programme in the vocational stream of Information Technology.

Objective of vocational course in computer applications are as follows:

i) To acquire basic knowledge of computer hardware, software and trouble shooting aids.

ii) To learn problem solving techniques and practice programming.

iii) To understand applications of computer in business organization.

iv) To develop skills of operating computer system in business environment.

Maheshwari, A.N. (1997) conducted a study on Information and Communication Technologies in School Education. The author has described in detail two case studies, one on the introduction of computers in schools and the other on the use of teleconferencing for inservice education of teachers.

He concludes that teachers inspite of their academic isolation, can update themselves with the latest learning resource put up by institutions from all over the world using Internet. In developing countries of Asia access to it might be limited to a few institutions and persons, but considering its cost effectiveness as a learning resource, especially when compared with the cost of expansion of schools and colleges, this technology will gradually be preferred for providing access to resources for developing new skills and competencies. Even when access to Internet has been arranged in schools it may not get fully used unless teachers are trained on how to use such a resource in teaching-learning. This would require inservice training in information technology skills and in new pedagogy, for which the required expertise might not be available at the grassroots. Training will have to be arranged periodically to update teachers on changes in the resources and on how to effectively use the support of the Internet for the attainment of curricular objectives.

A.B. Saxena (1998) studied "Effective Science Teaching in schools" and suggested some points to be kept in mind by the curriculum framers in order to make the curriculum relevant to the learners like Strategies for conceptual change, Model for curriculum construction,

Improving the quality of learning, making the curriculum relevant. She has graphically illustrated models for curriculum construction in her study.

Sindhu R.S. & Sharma, Rashmi (2004) made a study on Approaches to Science and Technology Education at School Level. According to them introducing science and technology education as a part of general education at school levels requires different formats for studying these subjects at school level which can be summarized as below: (1) Science and Technology as autonomous disciplines. (2) Science based technology courses in which scientific knowledge and principles are applied in practical contexts. (3) Technology based science courses in which a technological context is used as the basis for the understanding of science concepts. (4) A strand parallel to biology, chemistry, physics, earth science which are part of a coordinated science curriculum. (5) Science, Technology and Society approach (STS) approach.

But first approach alarms us about already loaded curriculum of general education. In second and third approaches, dominance of one subject over another takes place. Fourth one is a more reliable approach. The fifth approach is more appropriate. The technology is the cultural response to problems and opportunities which affect the way we work and live therefore societal aspects also should be included in the science and technology curriculum. This approach for teaching science and technology is known as Science Technology-Society approach.

2.2.0 Studies done abroad:

Michael Little dyke (1977) in his study on Managerial Style, the National Curriculum and teachers' culture: responses to educational change in a primary school analysed the effects of educational change on the attitudes and practices of teachers in a primary school which had a change of head teacher at the time of the introduction of the National curriculum reforms. The conditions and responses in the school, with a focus on the National curriculum for science, are compared with the wider influences of the National Curriculum for science concluded from research on a sample of 15 other primary schools. The influences are analysed from a political, technological and cultural perspective and the key issues identified relate to teacher autonomy and collaborative practice which affect the curriculum and teacher's culture. It was concluded that the managerial style and ideology of the head teacher had a direct influence on the culture and educational practice in a school and this has parallels with the way in which the National curriculum has been developed nationally.

Responses of teachers to contrasting management and organizational styles indicated that a degree of teacher autonomy is essential for teachers to feel valued and to have enough flexibility to develop innovative and responsive approaches to their pupils, which is necessary for the development of process skills in pupils. Conversely, an over-prescriptive curriculum and an instrumental, directive managerial style can inhibit process development and result in instrumental, inflexible teaching approaches in teachers.

F.L.J. De Souza (1978) investigated planning school education in Goa. Objective was to make a taluka-wise survey of all the school facilities made available in Goa during that time. His study was a descriptive survey of the existing school facilities, pre-service and in-service needs of schools teachers, and the inspection and supervision of schools in Goa. In case of in-service training, needs of school teachers in Goa, the investigator prepared a special questionnaire to find out the opinion of personnel mainly connected with the field of school education in Goa, so that a 'Tentative Schedule' could be prepared to ensure participation of every teacher in Goa, in the in-service training programme, atleast once in a period of five years. Regarding the provision of school inspection and supervision in Goa, the investigator gathered most of the information and data by interviewing a selected number of persons directly involved in the specific area of work.

Rosemary, E. Sutton (1980), Cleveland State University studied "Equity and Computers in the schools: A Decade of Research." In this review, the research conducted during the 1980's on race/ethnicity, gender and social class differences in K-12 educational uses of computers is summarized in terms of access, processes and outcomes. First gender, social class, and racial inequalities in access to computers were documented. Second, equity in four aspects of process is considered, type of use, teachers' attitudes towards equity and equality, curriculum content, and interactions among students. Third, the literature on three outcome variables was considered. Student attitudes, computer-related competence (literacy and programming), and traditional achievement measures using computer-aided instruction. Finally, implications from the

decade of research were drawn. These included the conclusions that the use of computers maintained and exaggerated inequalities, that equity issues were complex and future research should reflect this, that between school differences in equality should be examined, and that much more research on poor and minority children is a priority.

Chen Qi (1982) investigated the use of microcomputer in Chinese Secondary Schools and found that there were 3,319 secondary and primary schools own 33,950 microcomputers, and there were over 20,000 microcomputers available for the after school activity using. Among those schools, 84% of them offered an optional course or extra curricular activity. About 3,00,000 students had taken or were taking computer courses. In last three years, about 100 million Chinese yen was spent in the computer education in secondary and primary schools by State and Local Educational Commission. In the last two years, microcomputer availability in secondary schools had increased dramatically.

Robbat, Richard Joseph (1984) investigated the utilization of computers in high school History Education.

This study examined the use of computers in high school history education. It was designed to ascertain attitudes of high school history educators had toward use of computers in the discipline of history and in teaching of history, reason they used or did not use computers in their classes, and their reactions to a list of four recommended practices for storing data (information) basis; retrieving information; using computers in history education. The recommended practices included: developing and storing data (information) bases; retrieving information; presenting

data by use of statistical packages; and interacting with simulation and developing models for analyzing simulations.

The research sample consisted of 53 high school history educators from five districts each in Massachusetts and in Oregon. Districts selected included urban, suburban and rural and proximity to high technology industry. Of the 53 history educators interviewed, 43 were classroom teachers and ten were department chairs. In addition six district administrators were interviewed.

Analysis of study data revealed that only one history educator from the research sample was using computers for history instruction, though more than half of the classroom teachers in the sample had experience with computers. Reasons reported for not using computers in high school history education differed between those who had computer experience and those without such experience. Those with computer experience offered reasons based on school-centered organization issues. Those without computer experience offered reasons based on lack of knowledge about computers and their use in the study of history. The study sample reported that the recommended practices had value for high school history education.

Cornelius, Cleo Suzanne (1985) started an experiment to study A comparison of computer-based Data base instruction and retrieval strategies with traditional instruction.

The purpose of this study was to compare computer-based data base retrieval strategies with a traditional data base instructional strategy. The experimental study was conducted during the Spring Semester, 1985

at the Tyrone Area High School, Tyrone, Pa. The subjects were 36 high school seniors, subjects were randomly assigned to one of three treatment groups [a] control (C); [b] experimental group A (A); [c] experimental group B (B). One day prior to the treatment, all three treatment groups (A, B, C) were instructed on the organization and use of database next and computer-based retrieval strategies. The control group received a text-based database. Experimental group A received a computer based database and a procedure for retrieval. Experimental group B received a computer-based database and a different procedure for retrieval. A one day delayed post-test was administered to all subjects. At this time subjects also completed a 22-item attitude scale towards data based material and retrieval strategies. Five days after receiving the treatment, the subjects were administered the retention test. The findings resulting from testing all hypotheses, were as follows:

Null hypothesis 1 was not rejected, indicating that there were no significant differences in achievement among the treatment groups (A,B,C,) in the use of database retrieval strategies. Null hypothesis 2 was rejected, indicating a significant difference in achievement among the treatment groups (A,B,C) between pre and post, and post & retention tests with all groups improving from pre to post and pre to retention. Null hypothesis 3 was not rejected, indicating that there were no significant interactions among the three treatment groups (A,B,C) and the three test administrations (pre, post, retention). Null hypothesis 4 was rejected, indicating a significant material. Null hypothesis 5 was rejected indicating a significant difference among treatment groups (A,B,C) in attitude toward database materials and retrieval strategies.

Durnin, Robin Goeffrey (1985) conducted a study on computer based Education: A study of student interactions and achievement in small group and individual settings. Since computers are expensive tools of instruction, and limited in number, it is important to consider the advantages and disadvantages of students using them in small groups. Specifically, this study partially accomplishes the above by examining the impact that group size has on interaction and achievement. Various student interactions and achievements were documented and recorded during this study. The impact of group size on individual interactions was investigated by tabulating the frequency of observable behaviours when working along or in pairs, traids or quads. Success rates (i.e. achievement) were determined by scoring paper and pencil tests administered to the research subjects and asking these same students to respond to two oral questions. Documentation of student interaction and achievement was also provided by a qualitative description of each learning session. Results showed that small group usage of computer based learning materials influenced student behaviour. The findings indicated that working alone or in pairs and traids was not detrimental to student scholastic activity. Quads, however, seemed to be too large a group size for all four students to remain involved with either the program or with the other members of the instructional session. The findings of this study suggested that the use of computer based learning material should be restricted to individuals alone. Many benefits appear to accrue by having pairs, or groups of three working together.

Wang Songzan (1985) studied on How to develop the computer training for school children: A pedagogic view. He suggested a

methodology of teaching in images. It was decided that the process should start with similitude images on account of the fact that such a teaching-in-images method had proved a great success in lessons on the newly-developed Romanized Chinese alphabetic system before.

Sit T. Ong and Puay K. Tan (1985) conducted an exploratory study on the Effects of Computer-Assisted Instruction on the Attitudes and Achievement in Mathematics of Secondary School Students, Singapore.

Two groups of secondary three students each consisting of 27 members were taught the concepts of linear equations using two different modes of instruction; Computer-Assisted Instruction (CAI) using microcomputers, and Traditional Expository Instruction (TEI) without microcomputers. Analyses of data collected before the experiment shows that the two groups were comparable with respect to their attitudes and achievement in mathematics. After 12 lessons over a period of two weeks, the CAI group out-performed the TEI group. The CAI group was able to maintain their lead after a month on a retention test. However, CAI appears to have no effect on students' attitudes towards mathematics, probably due to the short duration of treatment. This study showed that CAI may be effectively incorporated into the normal classroom instruction of secondary mathematics.

Bella O. Marinas (1985) conducted a study on the utilization of microcomputers in secondary schools. Results of surveys in 169 schools, primary and secondary, government and private, and throughout the 13 regions of the country revealed that computers have been integrated in subjects like science and mathematics, offered as a separate course or a co-curricular activity of students. Policies and guidelines relative to

computer education had also been issued. The lack of resources, however, had hampered the establishment and maintenance of computer education programs. A computer education development plan should be drafted to enhance the use of computers in secondary education.

Patrick C.J. Nolan, Robert R. Shorp, Deborah A. Ayres (1986) investigated into the curriculum integration with computers in New Zealand Secondary Schools. A pilot research and development project in New Zealand examined the feasibility of an integrated approach to secondary school education as a curriculum alternative. The approach includes interdisciplinary knowledge, the use of a broad range of motivational strategies, new student and teacher roles, and application of computers. The main educational aim of the project were to provide effective and stimulating ways of learning and to present curricula as interactive and unified in nature, rather than as static and segmented. The computer plays a multiple-role as; a tool for learning and communication, a medium which invites practical applications and a facilitator of knowledge integration. It reported on these aspects and suggested a new role for computers, differing from the teaching of programming, awareness and history which is characteristic of computer education in New Zealand Secondary Schools.

Lee, Jooheon (1986) investigated into the application of scientific principles to curriculum development. The historical development of scientism in curriculum development was traced through examination of the ways in which the nine curricular variables of the study of schooling (SOS) model were treated. Also discussed were the inter relationships among variables which have occurred within the last several decades.

The first section of the study was devoted to early efforts of curriculum improvement using scientific principles. Principal references were the writings of F. Bobbitt, W.W. Charters, H. Harap and H. Rugg. The second section of the study distinguished two distinct senses of the term scientism by reviewing the contemporary literature in the curriculum field. Major findings of the study were as follows:

(1) The scientific curricularists past and present viewed the scientific method as a systematic and national way to improve the full functioning of education for meeting societal needs in the context of the child's total experience. (2) The behaviouristic curricularists defined an entirely different approach than that which the scientific curricularists, in the tradition of early leaders, have advocated. Their works have been prone to engage in narrowly based empirical studies that have little bearing on the wider conceptual problems of the curriculum field (3) When curricularists engage in scientific curriculum development, there has been no single method applied to scientific curriculum development. The study concluded that curricularists should struggle to explore questions by using whatever approaches hold promise for advancing curricular knowledge.

Murphy Colette (1991) investigated into the National Curriculum: Compulsory School Science – is it improving scientific literacy? The aim of the present study was to find out whether the introduction of compulsory school science has had a positive effect on scientific literacy. It presented the initial findings of a long-term study to examine whether the introduction of compulsory school science for pupils in UK schools in 1991 was effective in raising the general level of scientific literacy. The

use of the term 'scientific literary' in the literature was considered and a definition of the term as it is applied in the study was offered. The scientific literacy level of two groups of initial teacher training students with contrasting experiences of school science was compared. Students completed a simple science test that had been originally written for 11 year old children. The average test score of students who had experienced compulsory school science from the ages of 11 to 16 was found to be significantly higher (P=0.014) than that of students for whom school science was optional at secondary level. The study also highlights specific areas of conceptual difficulty in basic science experienced by almost all of the students tested. Test questions relating to the circulatory system, light and sound produced very low scores from almost all students, regardless of their science background.

The investigator concluded that despite the steady growth in primary science in Northern Ireland throughout the 1970s and 1980's by 1990 there were still very few secondary schools that took any significant account of their first year pupils' primary science experiences. In its overview of the implementation of the first year of the curricular requirements of the Education Reform Act 1988 in England and Wales, the HMI (DES, 1991) reported that, in respect of science at key stage 3, 'As was the case before the introduction of the NC, many schools took too little account of pupils' previous experience of science, so that the level at which the work was pitched was inappropriate.

Some types of primary/secondary contact seem to produce little by way of a shared understanding between primary and secondary teachers of science. In particular, the one-off meeting held in the secondary school

is often seen as unhelpful, where primary/secondary contacts are perceived to have failed', teachers are reluctant to try again, so it is all the more important that careful consideration is given to the approach to be adopted. In short primary/secondary contacts do not imply primary/ secondary continuity. Essentially, the issue here is that of differentiation. At the classroom level, many secondary science teachers find it difficult to deal with individual pupil's differences and, in the last analysis, primary science makes pupils different! The study considers the implications of these findings for science teachers and policy makers in both the primary and secondary teachers.

Dhand H. and Lyons, J. (1991) described the experiment on an innovative curriculum in social studies in Saskatchewan (Canada) which is inhabited by a sizeable population of Indian Origin. According to Dhand, H. and Lyons, J. (1991) social studies as an area of school curriculum is in a state of turmoil. Citizenship education and cultural literacy are its primary objectives. The major goals of the new curriculum in social studies are concerned with developing democratic understanding and values including national as well as personal identity, and development of abilities and skills for analyzing problems that affect us as members of a changing and complex world. The pedagogic techniques recommended for transacting the new curriculum include open-ended questions, value-clarification and value analysis, linking social studies content to the real life around and focus on global and peace education.

Mlanga, A.T.O's (1992) study explored the perceptions of high school-teachers, students, parents and educational administrators regarding the principles, practices and procedure of curriculum

development programmes for high schools in Nairobi, Kenya. The data were collected on a randomly selected sample of 200 high school-teachers, 150 high school-students, 200 parents and 50 educational administrators. The major findings of the study were that: (i) curriculum should be an organized set of learning experiences both within and outside the school environment; (ii) curriculum evaluation should be in terms of the extent to which educational objectives are being achieved; and (iii) there should be regular evaluation of the constructed curriculum.

Ruth Jarman (1997) studied Fine in theory: A study of primary secondary continuity in Science, prior and subsequent to the introduction of the Northern Ireland curriculum.

He presented the findings of a six-year longitudinal study designed to investigate secondary teacher's perspectives and practices in respect of primary-secondary continuity in science, both prior and subsequent to the introduction of the Northern Ireland curriculum. There was evidence of some, but not substantial change. Though most teachers recognized an increase in the science knowledge and skill of their incoming pupils, and a number had attempted to establish some contact with associated primary schools in respect of science, only a few had taken any account of children's earlier experiences in the planning and preparation of their secondary science programmes. Some of the underlying difficulties were discussed and issues which could inform the improvement of continuity and progression were considered.

Investigator concluded that finally many secondary science teachers needed support to help them respond positively to the diversity of experiences among their pupils which flow inevitably, from primary

science and this diversity was seen as a reason, or justification, for ignoring children's previous work. At the very least, there is much to be learned about how to talk purposefully to pupils about their earlier experiences. Thereafter it is almost certain, that provision for continuity will call for a more differentiated approach both to the design and to the delivery of the secondary science curriculum. He proposes that this would continue to represent a conspicuous challenge for secondary science teachers.

Elizabeth Wood (1999) studied "the impact of the National Curriculum on play in reception classes. She examined the impact of the National Curriculum on play in reception classes from two perspectives. First, the wider ideological, political and educational context of the policy changes is discussed. Secondly, insights into the realities of teachers' experiences are drawn from a research study, funded by the Economic and Social Research Council, which examined the relationship between nine reception teacher's theories of play and their classroom practice. The two themes arising from this study were addressed, namely the teachers' perceptions of the impact of the National Curriculum on their practice, and their provision for play as part of the planned curriculum. The evidence indicates how the teachers accommodated to the influence of the National Curriculum, while maintaining their commitment to play. Factors which mediate between their theories and practice were identified and implications were drawn for future curriculum development in the pre-school sector.

This research study has provided some insights into the impact of the National Curriculum on play in reception classes, drawing on the

perspectives of nine teachers. In the years between the introduction of the National Curriculum and the desirable outcomes, reception teachers were left in a hiatus. Given the pressures on early years teachers generally, it was inevitable that the National Curriculum would exert a downward pressure on reception classes. However, this study provides evidence that this influence was less negative than some commentators have suggested. All the teachers were able to integrate child-centred and subject-centred approaches to planning, a process which was also informed by broader learning and developmental aims.

Diane Shorrocks – Taylor and Melanie Hargreaves (1999) conducted a study on making it clear: a review of language issues in testing with special reference to the National Curriculum mathematics tests at key stage.

The advent of high-stakes national testing in England and Wales raised important questions about the nature and demands of the assessments in the core subjects and the validity and reliability of the test instruments. In a situation of independently completed, pencil-and-paper tests, the language used in the test questions becomes especially important, particularly in mathematics. This study set out a framework for beginning to analyse the problem, reviewing the literature and raising more focused questions. In conclusion, proposals were made for future lines of research in order to extend, understanding of how pupils read and process the information in test questions, interpret the demand and formulate a response.

Felicity Wikeley (1999) studied changes in school students' approaches to subject option choices: a study of pupils in the West of England in 1984 and 1996.

He reported on the second phase of an ESRC-funded project into the changing nature of pupil approaches to subject option choices in year 9. It highlights the reasons cited by a sample of pupils in four West of England comprehensive schools for choosing particular subjects and compares them with those given by a similar cohort 12 years ago. Although there is evidence that previous gender differences have reduced, other causes for concern have emerged: notably the decrease in the popularity and perceived importance of modern languages, and the possibility that the move away from the more practical nature of some subjects, such as PE and technology, has had a demotivating effect on boys. It also commented on the social class differences in pupil aspirations and knowledge about the ways of realizing those aspirations, as well as the conflict between the advice given by parents and schools to students when making their choices and the realities of the needs of the labour market for transferable skills. In broader terms, the 1996 interviews suggest that students from the lowest social class groups are disadvantaged by their lack of cultural capital in terms of making early subject choices, in so far as they do not appear to know the level of education needed for certain jobs. Pupils from the highest social group had higher career aspirations, and a better idea of what was required to attain them. The author finds it encouraging about these findings is that even those students who do not like English, Maths and Science still recognize that 'you need them', whatever your aspirations. On that level,

they are aware that there are wider needs than those relating purely to any specified career, and perhaps schools should do more to build on this awareness. However, there is also evidence of a broader failure to manage the curriculum so that it has appeal for both boys and girls of differing abilities and backgrounds, and so that it prepares pupils to make choices informed by much more than their, and their parents preconceptions as to what is needed for specific careers.

James Donnelly (2000) studied Departmental characteristics and the experience of secondary science teaching. He reported findings about the impact of departmental characteristics on secondary science teachers' work. It is drawn from a larger study, which also looked at ideological and material influences on practice. It focuses particularly referred to frequently when discussing their work. These were: the managerial style of the department; the use made of schemes of work; the emphasis on the science disciplines as compared with "science"; and the characteristics of pupils. It argues that such departmental characteristics are sometimes symbiotic, and that they are most subtly characterized in mainstream comprehensive schools. It also suggested that, while these influences do not necessarily lead to variation in the broad forms of pedagogy employed they are perceived by teachers as significantly influencing their professional working environment, and the experience of teaching science.

Petros Geoghiades (2000), studied beyond conceptual change learning in science education: focusing on transfer, durability and metacognition.

He advocated a shift in focus of conceptual change learning research in order to address these problems. It draws upon four overlapping areas: Conceptual change learning is the broad subject area that sets the epistemological background; transfer and durability of scientific conceptions are the two problem areas under scrutiny, while metacognition is seen as potential mediator of improvement.

Author suggested that the conceptual change learning CCL model should move a step further along the route to describing learning. Moving beyond successful CCL, it is important that students should be able to use their newly learned conceptions appropriately when encountering new contexts, and to refer back to these conceptions even after a considerable time has elapsed since they were first adopted. For this the author suggested two main research directions.

a) to investigate students abilities to transfer 'new' scientific conceptions to different settings, and

b) to investigate the durability of these conceptions.

In investigating the two problem areas, the role of metacognitive instruction within CCL should also be considered as a potential mediator of improvement.

William J. Sumrall, Donald N. Schillinger (2003) found, A Student Directed Model for Designing a Science/Social Studies Curriculum. His studies on Science/Technology/Society, outlined the primary objective of producing a scientifically literate citizenry. It included the following statements that relate to the integration of Social Studies and Science: The scientifically of science and technology as well as

i) uses concepts of science and technology as well as informed reflection of ethical values in solving everyday problems and making responsible decisions in everyday life;

ii) engages in responsible personal and civic actions after weighing the possible consequences of alternative options;

iii) analyzes interactions among Science, Technology and Society;

iv) connects the political, economic, moral and ethical aspects of science and technology as they relate to personal and global issues; and

v) connects science and technology to other human endeavours e.g.: History Mathematics, the Arts and the Humanities.

Science and Social Studies seek to resolve problems through a dynamic process that requires the transfer and synthesis of knowledge. To accomplish that, teachers and students need to use dynamic resources.

Troy, D. Sadler (2004) investigated about student conceptualizations of the nature of science in response to a socio-scientific issue.

2.3.0 CONCLUSION:

Most of the studies mentioned above pertain to implementation, evaluation and development of curriculum in Science, Social Studies and Information Technology at secondary school level in India and abroad. Therefore, their mention has relevance.

CHAPTER 3

CURRICULUM DEVELOPMENT AND SECONDARY SCHOOL EDUCATION IN SCIENCE, SOCIAL STUDIES AND USE OF INFORMATIOIN TECHNOLOGY

3.0.0 Introduction:

The curriculum is the plans made for guiding learning in schools, usually represented in retrievable documents of several levels of generality, and the implementation of those plans in the classroom; those experiences that take place in a learning environment that also influences what is learned.

3.1.0 The curriculum and the course of study:

The relationship between the curriculum and the course of study is an important one for clear understanding of curriculum programs. Curriculum and course of study are sometimes used synonymous. For example, Davis states: "The curriculum is the course of study." This has, in fact, been quite a generally accepted concept. When the curriculum is looked upon as being composed of the actual experiences children have under the direction of teachers, it obviously is impossible to consider it as synonymous with the course of study. In this case, the course of study becomes a printed guide which has been prepared to assist teacher to direct satisfactorily the development of the curriculum.

"The curriculum," it is stated, "may be defined as the totality of subject matter, activities, and experiences which constitute a pupil's school life.

3.2.0 Curriculum Reconstruction in India:

The first major attempt in curriculum reconstruction in India was made in 1937, when Gandhiji propounded the idea of basic education and Dr. Zakir Husain committee elaborated the scheme of studies of Basic education. However, much work in this direction could not be done as India was under the foreign rule. Secondary school curriculum on the eve

of Independence was indifferent to differential psychology and prescribed the same course with practically no variety, for all. It was over-crowded and yet lacking in rich and significant content, when India became Independent on 15th August 1947, a new page was turned in the history of Secondary Education. The next step in curriculum reconstruction of secondary education was taken with the appointment of the secondary education commission 1952-53.

Curriculum development process of secondary schools in India: Role of NCERT

According to an international comparative study of school curriculum, National Institute for Educational Research, 1999, the National Council of Educational Research and Training, NCERT is the national apex research institution which was set up in 1961 as an autonomous body under the Government of India. Its mandate is to assist and advice the Government of India in the formulation and implementation of policies and programmes in the field of school education. At the state level each state has State Council of Educational Research and Training (SCERT) which is a counterpart of the NCERT. The decisions regarding curriculum design are essentially done by professional bodies such as NCERT and SCERT.

The NCERT came out with a broad nationwide curriculum framework for the first time in 1975. National Curriculum for the ten year schools – A framework (1975) was the first attempt of its kind.

Second curriculum framework was brought out in 1988. It was

- National Curriculum for Elementary and Secondary Education – 1988.

The third curriculum framework was brought out in the year 2000. It was

- National curriculum framework for school education – 2000.

A comparative profile of the three generations of curriculum frameworks is given at the end of this chapter.

3.2.1 Secondary School Science, Social Studies and Use of IT:

Science and Social Studies form one of the crucial curricular areas. Their curricula should help in fulfilling the needs of the individuals and society and should keep pace with the changing times. It should be integrated with Information Technology. The use of computers is expanding extremely rapidly. IT is an interesting teacher. It is a powerful tool. It can make learning easier and more attractive for example; a resource for learning about animals could include written information about their habitat, and pictures of it. There could be video clips showing the animal running, accompanied by animal diagrams of the operation of their skeletal structure and muscles. This could be done using multimedia software.

CURRICULUM MODELS OF IT:

In practice, three basic models of the IT curriculum have emerged. These are:

- the subject IT Approach;
- the cross-curricular IT approach;
- the hybrid IT approach.

Subject IT:

This is the traditional approach. It is also referred to as the 'contralised' approach. IT can be taught as a separate subject; time can be allocated on the timetable for IT in the same way as it is allocated for Mathematics, Science, Social Studies, English and the other National Curriculum subjects. It is assumed that pupils will be taught IT, make use of IT, and be assessed in IT mainly in the timetabled subject of IT.

Cross-Curriculum IT:

In the cross-curricular approach, IT is taught and used only in the other NC subjects. There is no time allocated on the timetable specifically for IT as it is assumed that the teaching, use and assessment of IT will all take place in some, or all, of the other NC subjects. The cross-curricular model can be organized in a variety of ways for example, by mapping, the sub-themes of IT to several other NC subjects. The sub-themes represent coherent groupings of the subject content.

Hybrid IT:

There can be a variety of hybrid models used in practice. The extension of the cross-curricular model described in the previous paragraph is one such variant. Another can be 'a central core of IT running through each year and aimed at developing skills which can then be used across the curriculum. This approach attempts to combine the advantages of both the subject IT and cross-curricular IT models. In the 'ideal' hybrid model, pupils are taught and assessed by IT specialists in IT subject classes, and use IT across the curriculum wherever possible. A course in IT, taught by a specialist teacher, could prepare pupils for assessment in the IT short course, and for using IT in other NC subjects.

Such a course could occupy 5 percent of timetabled time. Pupils can be assessed by the IT specialist who teaches them. Pupils' use of IT across the curriculum will still need to be planned and recorded. However, teachers of other NC subjects will not need to teach and assess IT skills as this will be done in IT subject studies; these teachers can give due priority to their own subjects, making use of IT when appropriate.

On the whole, the hybrid model is acknowledged to be the most practical approach for schools.

The 'IT across the Curriculum' Game:

Roger Crawf in his book, Managing IT in secondary schools has explained that IT across the curriculum game helps participate to develop an understanding of the cross-curricular nature of IT and to appreciate its uses in all subjects of the curriculum. The curriculum Board (Fig. 1) is a grid with years 9 to 12 across the top and most of the NC subjects down the side.

It is a good framework for planning the IT curriculum.

The resources needed to play the game are:

- the Curriculum Board (see Figure 1).
- the Activity Cards (see Figure 2).
- the NC Programmes of study for IT.
- relevant external assessment syllabi for IT.

The rules of the game are:

1. The game is played in groups of five players.
2. Deal out the Activity cards equally, discarding the remainder.

3. Starting at the dealer's left, in turn, each player places an Activity card on the Curriculum Board.
4. When an Activity card has been placed by a player, the group decides whether it has been placed in an appropriate cell on the Curriculum Board.
5. If the Activity card has not been placed in an appropriate cell on the Curriculum Board, the Activity card is returned to the player who placed it. Otherwise, the Activity card remains on the Curriculum Board and the game moves on to the next player.
6. If an Activity card is placed on an IT cell, the player misses a turn.
7. If an Activity card is placed on a cell that already has an Activity card on it, the player misses a turn.
8. The winner is the player to discard all their Activity cards first.

Table 3.1: TRAINING ACTIVITIES

Year 9	Year 10	Year 11	Year 12	
				English
				Maths
				Science
				Information Technology
				Social Studies
				Modern Languages
				PE
				Other

TRAINING ACTIVITIES

Table 3.2: Activity cards for the 'IT across the curriculum' game.

Set up a data base of the names and addresses of pupils in their class.	Use a word processor to write a letter to a friend.	Control a turtle using a simple control language.	Describe how hospitals and GPs use IT to handle medical records.	Use a spread-sheet to work out percentage discounts on a range of goods.	Use search conditions with AND, OR and NOT operators to search a database.
Measure and record the temperature every hour for one month.	Format a floppy disk	Send personalized letters to sponsors of the football team.	Use different fonts, sizes and styles of text.	Use clip art to illustrate an advert for a sports shop.	Describe the function of a supermarket stock control system that uses bar codes.
Model the growth of bacteria using a spreadsheet.	Delete a file on a floppy disk	Use a spelling checker to help eliminate spelling mistakes.	Scan a photograph of themselves and include it in their c.v.	Discuss problems associated with the storing of personal data on a computer.	Guide a Valiant turtle around an obstacle.
Analyse survey data from questionnaires using a data base	Draft and edit an article for the school newspaper using a word-processor.	Set up a spreadsheet to work out the cost of making a bicycle.	Explain how feedback is used in a computer-controlled central heating system.	Generate pie diagrams, bar charts and line graphs using a spreadsheet.	Describe how to use an ATM or a cashpoint.
Explain how an automatic door works.	Extract a list of books on horses from a library database.	Discuss the social, economic, ethical and moral issues related to software piracy.	Copy a file onto a floppy disk from another floppy disk or a hard disk.	Design a questionnairesso that it is easy to input the data collected into a computer.	Use a data-base to sort a list of names into alphabetical order.
Write a logo procedure to draw a square	Describe how a robot can be made to	Design a questionnaire about	Draw a wallpaper design with a	Using IT, compose a piece of music and	Use a simple control language to

on the screen.	follow a dark line on the floor.	people's attitudes to a new supermarket.	repeated pattern.	print the score.	operate a computer-controlled robotic arm.
Using IT, modify a recorded piece of music so that it is played on different 'instruments'.	Design a company logo, business card and headed note paper.	Get information from a database and import it into a word-processed essay.	Use teletext, e.g. Ceefax, and explain how it is transmitted and accessed.	Draw a picture and print it.	Recognise that poor quality data may give inaccurate results.
Explain the advantages and disadvantages of electronic mail.	Write an article about a puppet show, and design tickets and posters advertising it.	Use IT to keep a record of the books they have read and their opinions of them.	Recognise blocks of text to improve the sense of a report about the youth club.	Write an illustrated book to help young children learn to read.	Record a piece of music and play it through a synthesizer at a concert.
Compare the use of a card index file with the use of a database.	Scan part of a magazine article and include it in a word-processed essay.	Save a file on a floppy disk and load it at a later data.	Set up a printer so that it is ready to be used.	Investigate how height is related to strength and speed.	Extract a list of books on cars by authors beginning with 'H' from a library catalogue.
Analyse census data and parish records on a database.	Layout a page of text and graphics for the school newspaper using DTP software.	Set up a view data system giving information about the day's events.	Scan a picture and modify it using graphics software.	Explore how to control inflation using a computer-based model of the economy.	Manage a petrol refinery using a computer-based simulation.

The Ministry of Education, Government of India in Dec. 1983 constituted a committee to "consider the desirability and feasibility of Introduction of Computer Science as an Elective Subject at the +2 level under the 10+2 system of education.

"Minimum vocational competencies based curriculum" computer technique was developed in a workshop organized by NCERT at Bhopal in December, 1983. The committee accepted the following courses for students and teachers.

(i) Computer Studies: Course A (Basic & Fortran).

(ii) Computer Studies: Course A (Basic & Cobol).

(iii) Computer Science: Academic Elective.

The NCERT also published a book entitled "Computer Literacy" in 1996.

A new department of Computer Education and Technological Aids (DCETA) was set up under the NIE during 1995-96.

During the year 2001, NCERT had published three volumes of instructional materials for students, titled Learning with computers (Level I, II and III). Prototype versions of a no. of multimedia learning programs for students were put up on NCERT's website.

Recently on 4th September, 2006 under the programme Sarv Shiksha Abhiyan, Govt. of N.C.T. of Delhi, Directorate of Education launched CALtoonZ 2006, an initiative which teaches the curriculum and the textbooks in the classroom through computer aided learning.

3.3.0 Commissions, Committees and Policies for the Secondary School Curriculum from 1947 to 2003 with special reference to Science and Social Science:

In order to enrich Secondary School Curriculum various commissions, committees and policies were appointed from time to time by the Government of India. They are as follows:

3.3.1 Secondary Education Commission (1952-53):

A number of commissions had been appointed before Independence and just after Independences to survey the Indian Education. The Government of India, appointed the Secondary Education Commission. Dr. A. Lakshmanaswami Mudaliar Vice-Chancellor, Madras University, Madras was its Chairman.

Secondary Education Commission recommended the following new organizational structure for secondary education after the 4 or 5 years of Primary or Junior Basic Education.

(i) A Middle or Junior Secondary or Senior Basic stage which should cover a period of 3 years;

(ii) A Higher Secondary stage which should cover a period of four years.

- In the first place, "according to the best modern educational thought; curriculum does not mean only the academic subjects traditionally taught in the school but it includes the totality of experiences that a pupil receives through the manifold activities that go on in the whole life of the school.

- Secondly, there should be enough variety and elasticity in the curriculum to allow for individual differences and adaptation to individual needs and interests.
- Thirdly, the curriculum must be vitally and organically related to community life.
- Fourthly, the curriculum should be designated to train the students not only for work but also for leisure.
- Fifthly, subjects should be inter-related and, within each subject, the contents should so far as possible be envisaged as "broad-fields" units which can be correlated better with life rather than narrow items of information.

The curriculum at the Secondary and Higher Secondary School Stage as recommended by Secondary education commission:

A.(i) Mother tongue or Regional language or a composite course of the mother tongue and a classical language.

(ii) One other language to be chosen from among the following:

(a) Hindi (for those whose mother tongue is not Hindi).

(b) Elementary English (for those who have not studied it in the middle stage).

(c) Advanced English (for those who had studied English in the earlier stage).

(d) A modern Indian language (other than Hindi).

(e) A modern foreign language (other than English).

(f) A classical language.

B. (i) Social studies – general course (for the first two years only).

(ii) General Science including Mathematics – general course (for the first two years only).

C. One craft to be chosen from the following list (which may be added to according to local needs):

(a) Spinning and weaving; (b) Wood-work; (c) Metalwork; (d) Gardening (e) Tailoring; (f) Typography; (g) Workshop practice; (h) Sewing, Needlework and Embroidery; (i) Modelling.

D. Three subjects from one of the following groups:

Group 1 (Humanities)

(a) A classical language or a third language from A (ii) not already taken; (b) History; (c) geography; (d) Elements of Economics and Civics; (e) Elements of Psychology and Logic; (f) Mathematics; (g) Music (h) Domestic Science.

Group 2 (Sciences)

(a) Physics; (b) Chemistry; (c) Biology; (d) Geography; (e) Mathematics; (f) Elements of Psychology and Hygiene (not to be taken with Biology).

Group 3 (Technical)

(a) Applied Mathematics and Geometrical Engineering; (b) Applied Sciences; (c) Elements of Mechanical Engineering; (d) Elements of Electrical Engineering.

Group 4 (Commercial)

(a) Commercial Practice; (b) Book-Keeping; (c) Commercial Geography or Elements of Economics and Civics; (d) Shorthand and Typewriting.

Group 5 (Agriculture)

(a) General Agriculture; (b) Animal Husbandry; (c) Horticulture and Gardening; (d) Agricultural Chemistry and Botany.

Group 6 (Fine Arts)

(a) History of Art; (b) Drawing and Designing; (c) Painting; (d) Modelling; (e) Music; (f) Dancing.

Group 7 (Home Science)

(a) Home Economics; (b) Nutrition and Cookery; (c) Mother Craft and Child Care; (d) Household Management and Home Nursing.

E. Besides the above a student may take at his option one additional subject from any of the above groups irrespective of whether or not he has chosen his other options from that particular group.

These seven groups of optional courses were recommended by the Secondary Education Commission. However, the State Departments of Education were free to examine the position in the light of their experiences and modify or add to these groups.

3.3.2 Committee on Rural Education (1957):

During 1957-58 under the scheme for the introduction of Agriculture and Science courses in rural secondary schools, eighty agricultural and science courses were started in rural secondary schools during the year. The committee appointed in 1957, by the Ministry of Education, under the Chairmanship of Shri B. Mukherjee went into the various problems of rural education.

3.3.3 Integration of Post-Basic and Multipurpose Schools (1957):

The standing committee of the Central Advisory Board of Education on basic education in their sixth meeting held in August, 1957, felt that the multilateral schools and post-basic schools should not be regarded as two parallel systems but each should be regarded as an integral part of the other. The Education Secretary was, therefore,

requested to set up a small committee of experts from the Ministry of Education and the local education units for understanding a comparative study of the syllabi of the multilateral and the existing post-basic schools and finding out common points which would help in bringing the two types nearer to each other.

3.3.4 Indian Parliamentary and Scientific Committee (1961-64):

The Indian Parliamentary and Scientific Committee was formed in August 1961 with Shri Lal Bahadur Shastri as its Chairman. Its primary objective was to study and examine the problem of 'Science Education in Schools'. In 1962 it formed a study group with Shri H.C. Dasappa, M.P. as Chairman. The committee had several meetings and Members of Parliament of both the Houses took keen interest in its deliberations.

Its objectives were:

(a) To study and examine early in 1962 the problem of Science Education in schools, and

(b) To find out the position of how science courses were organized in primary, middle and high/higher secondary schools in relation to policies and decisions arrived at the center and the states when the third plan commenced.

Major recommendations regarding textbooks

In textbooks dealing with languages and social studies adequate attention should be paid to the needs, experiences and problems of girls by including such topics as special festivals of women, games popular with girls, lives of great women etc.

Promotion of Science Education: During 1965, on the recommendation of the Education Minister's conference on the reconstruction of

Secondary Education, the CABE accepted that at the secondary stage, increased provision should be made for the study of elective science courses and teaching of general science as a compulsory subject for those who do not offer elective science.

3.3.5 Committee on Differentiation of Curricula for Boys and Girls (1961-64):

The National Council for Women's Education, in its meeting held in 1961, authorized its Chairman to set up a committee to examine comprehensively the problem of curricula for girls at all stages of education.

Major Recommendations

Proposals for differentiation of curricula: In the ultimate democratic and socialistic pattern of society, education will be related to individual capacities, aptitudes and interests which are not related to sex. There would, therefore, be no need in such a society to differentiate curricula on the basis of sex. But certain psychological differences between men and women formed the basis for building up the curricula for boys and girls.

Secondary Stage:

(a) The accepted policy at the secondary stage is to provide diversified curricula to meet the aptitudes and capacities of all adolescents. If properly implemented, this programme could provide for all the special needs of girls. Diversified courses such as those for home science, fine arts, music, etc. should be increasingly introduced at the secondary stage to meet the special needs of girls. These electives should not, however be made compulsory for them.

(b) Special encouragement should be given to girls who study mathematics or science at the secondary stage, and special efforts should be made to prepare women teachers of mathematics and science.

3.3.6 Panel on Science Education in Secondary Schools (1964):

A panel was set up in May 1964 in pursuance of a meeting held by the Planning Commission under the Chairmanship of Prof. M.S. Thacker, Member, Planning Commission. The panel was broad-based and composite representing State Governments, Education Boards, Ministry of Education, Council of Scientific and Industrial Research, National Buildings Organization, Indian Standards Institute and Independent Scientists. The panel examined the procedure for the allotment of funds and procurement of equipment in secondary schools and thereafter drew standard lists of equipment for science laboratories of secondary schools and suggested grants for the purpose.

Chairman of the Panel was Dr. K.N. Mathur, Scientist Emeritus, Council of Scientific and Industrial Research, New Delhi with 19 other members in it.

Its Recommendations:

- The lists of equipment for physics, chemistry and biology laboratories of high schools be prepared on the basis of the syllabi of Maharashtra and U.P. Boards and indicate generally the minimum equipment that a high school should have. Necessary modifications may be made to suit requirements of syllabus of the Board concerned.

- The essential items of apparatus, as mentioned in the lists of equipment and apparatus, should be supplied immediately when science is introduced in class IX. The desirable items of equipment may be supplied in installments during the subsequent two or three years.
- Boards of Secondary Education should introduce a system of evaluation of students practical laboratory work.
- Students should be encouraged to make simple scientific instruments themselves, since it will give them a practical bias to learn science at the secondary school stage.
- Creation of a separate branch of Science Education in each State Department of Education for improvement of science teaching.

3.3.7 Committee on Girls' Education (1963-64):

The Chairman of the National Council for Women's Education accordingly appointed in May 1963, a committee with Shri M. Bhaktavatsalam, Chief Minister, Madras. Eight others members were also there in the committee.

The committee recommended that at the secondary stage the central assistance should be provided for separate schools for girls, (ii) hostels, (iii) Grant of free books, writing materials and clothing to girls; and (iv) preparation and appointment of women teachers in increasing numbers.

3.3.8 Committee on School Textbooks (1966):

The Government of India, Ministry of Education, set up a committee in 1966 under the Chairmanship of Prof. K.G. Saiyidain, Director of the Asian Institute of Educational Planning and

Administration, New Delhi to advise the Government of India on the principles to be adopted in the preparation and assessment of textbooks suitable for a secular state. The committee held eight meetings in the course of work. In addition to discussing the various aspects of the problem and critically examining some of the textbooks of Uttar Pradesh and Madhya Pradesh, the members of the committee interviewed representatives of minority communities, representatives of the Education Departments of Uttar Pradesh and Rajasthan and a few eminent educationists including the then Vice-President, Dr. Zakir Hussain.

The terms of reference of the committee were as follows:

(a) To examine the specific complaints regarding books brought to the notice of the committee from different states and to test their validity with particular reference to the need for promoting inter-communal and inter-regional understanding;

(b) To state the general principles to be adopted in the preparation and assessment of textbooks with special reference to the teaching of languages, history and social studies; and

(c) To suggest a practical programme of action for the preparation and assessment of textbooks prepared on the basis of principles so enunciated.

Recommendations:

Teaching of History: One of the most sensitive areas demanding delicate handing lies in the preparation of textbooks for history in the schools. The discipline of the subject requires objectivity and precision and dispassionate study of facts. It would be unwise not to state facts with accuracy and objectivity in history readers, as there can be no

compromise with truth. This is an important element in the education of the young. There is, however, an element of interpretation in the treatment of historical data and it is essential to ensure that history is interpreted in a manner which will assist in the cultivation of understanding and in promoting the sense of national integration. It will do no good if historical facts or incidents are either mis-stated or ignored in schools. Those among the students who may later become scholars of history will feel resentment when they discover later that they were willfully fed on lies. The great challenge in the preparation of good history readers lies in the wise and careful selectivity of material. Greatest care and caution must be exercised by knowledgeable writers in including material which will neither entail sacrifice of truth nor of the elements required for the building up of a peaceful, tolerant minded and united nation.

3.3.9 Education Commission, 1964-66 (Kothari Commission):

The unique feature of this commission was not to limit its inquiry to any specific sector or aspect of education as the earlier commissions had done but to have a comprehensive review of the entire educational system. The commission set up 12 task forces and 7 working groups.

Extracts from the Report were:

Science as a Basic Component of Education and Culture:

Science education must become an integral part of school education; and ultimately some study of science should become a part of all courses in the humanities and social sciences at the secondary and university stage, even as the teaching of sciences can be enriched by the inclusion of some elements of humanities and social sciences.

Vocationalization of Secondary Education:

Another programme which can bring education into closer relationship with productivity is to give a strong vocational bias to secondary education, and to increase the emphasis on agricultural and technological education at the secondary school stage.

1. Science Education must become an integral part of school education

2. Specialization in classes XI and XII

Classes XI and XII (and during the transitional period class XI only) should provide for specialized studies in different subjects at the higher secondary stage.

3. Two years duration of Higher Secondary Stage.

The higher secondary stage should be extended to cover a period of two years and to be located exclusively in schools.

4. Instructional days in schools

The number of instructional days in a year should be increased to about 234 (or 39 weeks) for schools and 216 (or 36 weeks) for colleges.

5. Holidays to be Minimized. There is no need to close an educational institution on a religious holiday. Nor is it necessary for instance to close it on birthdays or death anniversaries of great Indians; the time could be better utilized in working hard for national development.

6. Working Days. In an academic year, the hours of instruction at the secondary stages should not be less than 1,000 and preferably raised to 1100 or even 1200 if conditions are favourable.

7. Maximum utilization of School Facilities:

The libraries, laboratories, workshops, craftsheds, etc., should be open all the year round and should be utilized for at least eight hours a day.

8. Two sets of curricula. The State Boards of school education should prepare two sets of curricula – advanced and ordinary. Every school need not adopt the advance curricula in all the subjects.

9. Three of Four Textbooks for each subject: No useful purpose is served by having only one textbook in a subject for a given class. It should be an important objective of policy to have atleast three or four books in each subject for each class and leave it open to the teacher to choose the book best suited to the school. This was necessary even if there were to be common syllabus for all schools.

Enrichment of the curricula and improvement of quality:

An equally important aspect was qualitative improvement so that the instruction imparted became good education and helps children to grow into useful and responsible citizens. The teaching of science had to be vitalized, the entire curriculum had to be overhauled and improved, and modern methods of teaching and evaluation were adopted.

School Curriculum:

Standards of Attainment at Secondary Stage:

The standards should be defined in terms of the knowledge, skills, abilities and attitudes to be developed with reference to the overall objectives of school education.

Lower Secondary Stage (Classes IX – X)

(a) Three Languages

(b) Mathematics

(c) Science

(d) History, Geography and Civics

(e) Art

(f) Work Experience and Social Service

(g) Physical Education

(h) Education in Moral and Spiritual Values

Higher Secondary Stage (Classes XI – XII)

(1) Any two languages, including any modern Indian language, any modern foreign language and any classical language.

(2) Any three subjects from (a) An Additional Language (b) History (c) Geography (d) Economics (e) Logic (f) Psychology (g) Sociology (h) Art (i) Physics (j) Chemistry (k) Mathematics (l) Biology (m) Geology (n) Home Science.

(3) Work-Experience and Social Service

(4) Physical Education

(5) Art or Craft

(6) Education in Moral and Spiritual Values

Advancement and Enrichment Programmes at Secondary Stage:

At the secondary stage, diversified courses are not favourable. There should be organization of courses at two levels – ordinary and advanced – beginning with class VIII. Advanced courses may be offered in various subjects and should be included in the curriculum on an optional basis.

3.4.0 National Policy on Education (1968):

The Education Commission 1964-66 recommended that the Government of India issued a statement on the National Policy on

Education which provided guidance to the State Governments and the local authorities in preparing and implementing educational plans. In 1967 the Government of India constituted a committee of Members of Parliament on Education to prepare the draft of a statement on the National Policy of Education.

Some relevant extracts from the policy are as under:

1. Science Education

With a view to accelerating the growth of the national economy, science education should receive high priority. It should be an integral part of general education, till the end of the school stage.

2. Production of Books

(i) The quality of books should be improved by attracting the best writing talent through a liberal policy of incentives and remuneration.

(ii) Frequent changes of textbooks should be avoided and their prices should be low enough for students of ordinary means to buy them.

3.4.1 National Committee on 10+2+3 Educational Structure (1973):

On the recommendations of the Education Commission 1964-66, the 10+2+3 structure was incorporated in the statement of the National Policy on Education, 1968. It was thought that a new programme of curriculum development should be undertaken by the adoption of a broadly uniform pattern popularly known as 10+2+3 pattern, throughout the country. The structure was discussed and endorsed by a number of All India Forums on education including the Central Advisory Board of Education.

Major Recommendations were as follows:

Curriculum Reconstruction: The new educational structure does not envisage mere addition of one year to the total period of education or taking away of one class from the collegiate stage to school education or vice-versa. The curriculum should also be in accordance with the current needs of the society, allow mobility of children from one state or territory to another, and help national integration.

Secondary Stage Curriculum:

The new classes IX and X should provide for a good course of general education. This is too early a stage for any specialization. The curriculum, therefore, should include, compulsory teaching of the following:

1. Teaching of Language(s)
2. Modern Mathematics
3. Sciences
4. Social Sciences
5. Moral Education
6. Physical Education
7. Craft or Trade

The curriculum should in addition, provide for one optional subject out of the usual academic and practical subjects relevant to this stage of education.

Higher Secondary Stage (Classes XI & XII):

The curriculum of the new classes XI and XII should be built on the latest curriculum for the new classes. IX and X should provide for two streams, i.e.,

(i) Academic Stream, and

(ii) Vocational Stream

Location of the New Classes XI and XII:

It was desirable that on academic and pedagogic considerations, the new classes XI and XII should form part of the school system and should, as far as possible, be located in selected schools.

3.5.0 Expert Group on Curriculum for the Ten-Year School: A Framework (1975):

The school curriculum of a country, like its constitution, reflects the ethos of that country as also its chief concerns. With a view to formulating a meaningful curriculum, the Ministry of Education and Social Welfare constituted an expert group in 1973 to develop the curriculum for the 10+2 pattern. A national conference was also held in August 1975 on the subject which was attended by about 200 educationists from all over the country. The document includes subject-wise instructional objectives and methodology of teaching.

A curriculum may be regarded as the sum total of all deliberately planned set of educational experiences provided to the child by the school. As such it is concerned with.

(i) The general objectives of education at a particular stage or class.

(ii) The subject-wise instructional objectives and content.

(iii) Courses of study and allocation

(iv) Teaching-learning experiences

(v) Instructional aids and materials

(vi) Evaluation of learning outcomes and feedback to pupils, teachers and parents.

Objectives for the Secondary School Stage:

As suggested by the expert group on curriculum for the ten year school. Lower secondary schools should work for six days in the week. Assuming that there should be 48 periods per week, each of 30-40 minutes duration, the instructional periods may be distributed as given below. However, schools might make suitable modifications, wherever necessary, since what is indicated here is notional.

Table 3.3: Instructional periods

Classes	Subject	Periods per week
IX-X	First Language	8
	Secondary Language	5
	Mathematics	7
	Sciences (life sciences and physical sciences)	7
	Social studies (history, geography, civics & economics)	6
	Arts	4
	Work experience	5
	Physical education, health education and games	6
	Total	**48**

3.5.1 Curriculum Committee on Higher Secondary Education and Its Vocationalization (1976)

The introduction of the new pattern of education 10+2 envisaged the vocationalization of higher secondary education at an extensive scale. Accordingly NCERT prepared a document and spelled out details of

implementing the scheme. The Curriculum Committee included 54 experts in the field.

Diversification and Flexibility:

The characteristic feature of the last two years of schooling (called the higher secondary) is diversification, the aim of which is to avoid forcing students into the academic channel alone and to offer them opportunities to choose subjects and programmes to study in a much wider field of education. A necessary feature of the higher secondary education would, therefore, be the provision of a large number of vocational streams which would generally be terminal. The system itself would, however, be so designed that a student may be allowed to transfer from the academic to the vocational stream, and vice versa without having to start in the other stream from the very beginning; there will also be provision for pursuing some of the study through part-time and correspondence courses.

Vocationalization of higher secondary education cannot be equated with mere technician training, it is essentially education in the broader sense of the term. It prepares and cultivates the individual to understand the social reality.

3.5.2 Review Committee (Ishwarbhai Patel Committee) on the Curriculum for the Ten-Year School (1977)

The New Pattern of Education 10+2 had been introduced in several schools in the country. The National Council of Educational Research and Training had prepared a new curriculum and textbooks which came under heavy criticism due to various reasons. In the meanwhile there was a change of government at the centre and the Janata Government with

Shri Morarji Desai came to power in 1977. It became natural for the Ministry of Education to review the educational policies of the earlier government. Thus a Review Committee popularly known as Ishwarbhai Patel Committee was appointed by the Union Minister of Education and Social Welfare, in his capacity as President of the NCERT. The Review Committee headed by Shri Ishwarbhai J. Patel (Vice-Chancellor, Gujarat University) had 30 members.

The Review Committee aimed:

1. To review the stage wise and subject wise objectives identified in the NCERT document. 'The Curriculum for the Ten-Year School'.
2. To scrutinize the NCERT syllabus and textbooks, in the light of the review as per (1) above.
3. To scrutinize the scheme of studies, as given in the said document, and examine whether any suitable modifications in either the scheme of studies or the time-table or both should not be made and to propose suitable staffing pattern.
4. To review the present scheme of studies and the time allocated for various subjects with a view to ensuring that:

   (i) the teacher has adequate time for experimentation, creative work, remedial instruction, etc.

   (ii) to accommodate the needs of the bright child for advanced level courses, the specific interests and aptitude, or the lack of it, in children, in only certain subject areas, keeping in view the national goals of development and objectives of education.

Table 3.4 Structure Curriculum Pattern and Time Allocation

	Classes IX-X	Time allocation (per week)
1.	Languages	8 hours
2.	Mathematics: Alternative I or Alternative II	4 hours
3.	Science (Theory and Practical): Alternative I or Alternative II	5 hours
4.	History, Civics and Geography – as one course	3 hours
5.	One of the following: The Arts (Music, Dancing, Painting etc.), Home Science, Agriculture, Commerce, Economics, Social Reconstruction, Classical Languages etc.	2 hours
6.	Socially Useful Productive Work and Community Service	6 hours
7.	Games, Physical Education and Supervised Study	4 hours
	Total	**32 hours**

3.5.3 National Review Committee on Higher Secondary Education (1978)

The National Review Committee appointed by the Union Minister of Education in October 1977 to review the curriculum of the +2 stage of school education with special reference to vocationalization of education. The committee submitted its report in 1978. The review was needed in the light of the document 'Higher Secondary Education and its Vocationalization' published by the NCERT in September 1976, Report of the Ishwarbhai Patel Committee (1978) on 10 year school curriculum and the formulation of the Sixth Five-Year Plan. The report of the committee has been entitled, "Learning to do towards a learning and Working Society."

The terms of reference of the National Review Committee for the +2 curriculum were as follows:

(i) To review the NCERT's document "Higher Secondary Education and its vocationalization" and to suggest modifications therein, if any.

(ii) To study the syllabi and courses of the CBSE and a few State Boards with special reference to a few selected vocations and to recommend appropriate syllabi.

(iii) To recommend a plan of action for introduction of vocationalization of the Secondary/Higher Secondary stage.

Curriculum and textbooks:

The curricula should be so structured that the courses lend themselves to imparting instruction in terms of well connected modules to enable the students to choose and combine them according to their needs.

In order to impart instruction in vocational courses, in agriculture and related subjects, it was recommended that the books be written on a priority basis to suit total condition and made available to the schools.

3.5.4 Working Group on Autonomous Schools (1981):

The Report of the Education Commission 1964-66 had said the schools should not only be freed from the requirements of an external examination but should be permitted to frame their own curricula, prescribe their own textbooks and conduct their educational activities without departmental restrictions...

Fr. T.V. Kunnunkal (then) Vice-Chairman, CBSE (Convener) and eight other members formed the Members of the working group.

3.6.0 National Curriculum for Primary and Secondary Education: A Framework (1985):

The curriculum framework may broadly be interpreted as a framework for institutional reform in the field of education. It was considered as a guide to facilitate the process of curriculum change with a thrust on institutional reform. It continued to guide till the publication of the revised version of 'National Curriculum for Elementary and Secondary Educations A Framework, 1988'. The curriculum was prepared by the NCERT after conducting several meetings and seminars. Representatives of the State/Union Territory Governments participated in the deliberations of the meetings. The document covered four areas – Emerging concerns and imperatives, Curriculum organizations, Evaluation and Implementation.

3.6.1 National Policy on Education (1986):

The document 'Challenge of Education' (1985) was debated in the country at various conferences, seminars and study circles etc. It is of great interest to note that the document was translated practically into all the regional languages. 5,80,000 copies of this document in English, 2,40,000 in Hindi and 4,000 in Urdu were distributed by the Ministry, inviting suggestions and comments from all sections of the people. As a part of the nation-wide debate for the formulation of the new policy on education, 12 National Seminars and 17 sponsored seminars were organized by the Ministry of Education and its national organizations. All State Governments and Union Territories also organized seminars, workshops and symposia. A detailed analysis was made of all the communications and recommendations received in the Ministry.

Thereafter, the Ministry of Human Resource Development brought out a revised document 'National Policy on Education 1986 – A Presentation'. This paper was discussed at the meetings of the State Ministers of Education, the National Development Council and the Central Advisory Board of Education. It was revised in the light of these discussions and the 'Draft National Policy on Education 1986' was finally laid on the table of Parliament in the first week of May, 1986.

The National Policy on Education was adopted by the Lok Sabha on May 8, 1986 and the Rajya Sabha on May 13, 1986. A promise was made at that time by the Minister of Human Resource Development that he would present in the Monsoon session a programme of Action for the implementation of the Policy.

Content and Process of School Education

The Policy and its Implications:

2. The parameters related to the reorientation of the content and process of education, as indicated in the NPE are:

(i) access to education of a comparable quality for all irrespective of caste, creed, location or sex.

(iii) Articulation of a national system of education with a common structure, national curricular framework which contains a common core.

(ix) effective use of modern communication technology for generation and dissemination of educational programmes, training, packages, and for creating awareness.

Intervention Programmes:

3. The intervention programmes broadly covered orientation in curricular areas, inservice teacher training, support systems, use of technology for motivation and monitoring.

The modes of intervention and the corresponding programmes as deduced from the policy are as follows:

(a) Content Reorientation:

(1) National core Curriculum

(2) Revised Work Experience Programmes

(3) National Curriculum Framework, Syllabi and Instructional Packages.

3.6.2 Programme of Action, 1986

After the declaration of the National Policy on Education, 1986, the Ministry of Human Resource Development, formerly known as Ministry of Education, Government of India, announced the programme of Action for its implementation. This was the first time in the history of educational development in independent India that such a follow up programme was prepared. Twenty-three Task Forces were prepared and each was assigned a specific topic covered by the National Policy on Education, 1986 (NPE). Eminent educationists, experts, senior bureaucrats and representatives of the Central and State Governments were associated with these Task Forces.

The document on programmes of Action was discussed in the meeting of the Central Advisory Board of Education held at New Delhi on the 1st and 2nd of August 1986. The Final Programme of Action was presented to Parliament on August 8, 1986. The Lok Sabha and the Rajya

Sabha discussed and approved the Programme of Action on 22 and 23 August 1986 respectively. It contains twenty-four well intentioned excellent essays on various aspects of education. There are five paragraphs on Secondary Education and Navodaya Vidyalayas and 9 paragraphs on Media and Educational Technology (including use of Computers in Education).

3.7.0 National Curriculum for Elementary and Secondary Education (1988):

The national curriculum has been prepared by NCERT in the light of the major thrusts and recommendations highlighted in the National Policy on Education. It was the outcome of a national seminar and four regional seminars. These seminars were attended by the representatives of all the State Boards of School Education / Secondary Education, the Central Board of Secondary Education (CBSE) and the Kendriya Vidyalaya Sangathan (KVS) also participated in the seminars and meetings.

The document contains four chapters as under:

1. Emerging Concerns and Imperatives
2. Organization of Curriculum
3. Evaluation and Examination Reform
4. Implementation

Curricular Concerns

The document lists the following curricular concerns.

1. Socio-cultural, Political and Economic considerations:

(a) Equality of Education and Opportunity

(b) Preservation of Cultural Heritage

(c) Constitutional Obligations

(d) Strengthening of National Identity and Unity

(e) Character Building and Inculcation of Values

(f) A Global Perspective

(g) Protection of the Environment and Conservation of Natural Resources.

(h) Observation of Small Family Norms

(i) Future-Oriented Education

3.8.0 Ramamurti Review Committee (1990):

The short-lived Janata Government headed by Shri V.P. Singh, Prime Minister of India, appointed a committee on May 7, 1990 to review the National Policy on Education, 1986, formulated by the Congress government under Shri Rajiv Gandhi. The Committee for Review is popularly known as Ramamurti Review Committee after the name Acharya Ramamurti who was the Chairman of the Committee. The committee submitted its report to the Minister of State in the Ministry of Human Resource Development on December 26, 1990 the same was tabled in the Parliament on January 9, 1991.

Some Extracts from the Report regarding Structural Changes in Secondary Education.

In order to make, vocationalization a success, substantial structural changes were introduced in secondary education along the principles of modular courses and credit accumulation, at the same time providing flexibility for multiple exist and entry points for the students.

This made it possible for the schools to offer vocational courses in varying combinations with subjects such as Languages, Mathematics,

Sciences and Social Sciences. No doubt, vocational and non-vocational subjects should be inter-woven both at the level of content and Pedagogy.

3.8.1 CABE Committee or Janardhana Reddy Committee (1992):

The National Policy on Education (NPE) adopted by Parliament in May, 1986 was followed up by the Programme of Action (POA) which was adopted by Parliament in August, 1986. Para 11.5 of NPE envisages a review of the implementation of various parameters of the Policy every five years. The Central Government had, in May 1990, appointed a National Policy on Education Review Committee (NPERC) to review NPE, 1986, under the Chairmanship of Acharya Ramamurti. The committee submitted its report on 26th December 1990. The report was tabled in both the Houses of Parliament on 9th January 1991. The Central Advisory Board of Education (CABE) in its meeting held on 8-9 March, 1991 examined the procedure to be adopted for consideration of the report of the NPERC and decided that a CABE Committee be constituted by the Chairman, viz., Union Minister of Human Resource Development, to consider the recommendations of the NPERC.

In pursuance of the above decision, the Chairman of the CABE appointed a committee on 31st July, 1991, to review the implementation of various parameters of NPE taking into consideration the report of the NPERC and other relevant developments since the policy was formulated and to recommend modifications to be made in NPE.

Shri Janardhana Reddy was the Chairman and 15 other members formed the committee.

3.8.2 Revised National Policy on Education (1992)

Revised National Policy on Education was presented in the Parliament (both the houses) on May 7, 1992. It may be recalled that NPE, 1986 had stipulated, "The implementation and parameters of the New Policy must be reviewed every five years.

3.8.3 Learning Without Burden: Report (1993)

From time to time a great concern regarding academic burden on students and unsatisfactory quality of learning has been voiced in our country.

With a view to have a fresh look on this problem, the Ministry of Human Resource Development, Government of India appointed a National Advisory Committee in March 1992. The Committee was headed by Prof. Yash Pal, Former Chairman, University Grants Commission and included 7 other members. The committee gave its recommendations in July 1993.

Recommendation No. 2(a):

The process of curriculum framing and preparation of textbooks be decentralized so as to increase teachers' involvement in these tasks.

Recommendation No. 12(a):

A project team with a number of sub-groups be set up in each state to examine the syllabi and textbooks for all school classes. The sub-groups be required to decide the following:

(i) The minimum number of topics required to be taught.

(ii) The minimum number of concepts to be introduced within each topic.

(iii) The total time needed for teaching this minimum number of concepts comfortably by a teacher in the total working days realistically available in a year.

Recommendation No. 12(e):

The syllabi of natural Sciences throughout the secondary and senior secondary classes be revised in a manner so as to ensure that most of the topics included are actively linked to experiments or activities that can be performed by children and teachers.

3.9.0 National Curriculum Framework for School Education-2000:

A discussion document was published by NCERT (National Council for Educational Research and Training) in the year 2000. This document provided a curricular framework for all the stages of school education – Elementary to Senior Secondary stage.

According to NCFSE-2000, General Objectives of Education are as follows:

School Curriculum should aim at enabling the learners to acquire knowledge, develop understanding and inculcate skills, positive attitudes, values and habits conducive to the all round development of their personality.

School curriculum should, therefore, help to generate and promote among the learners:

1. Language abilities (listening, speaking, reading and writing) needed for social living and further learning;

2. Communication skills (verbal and visual) for effective participation in day-to-day activities;
3. Mathematical abilities to develop a logical mind and enable learners to perform simple mathematical operations and their application in every day life;
4. Scientific temper characterized by spirit of enquiry, courage to question and objectivity leading to elimination of obscurantism, superstition and fatalism;
5. Knowledge of scientific methods of enquiry and its use in solving problems;
6. Understanding of the environment in its totality (natural and social, and their interactive processes), the environmental problems and the ways and means to preserve the environment;
7. Abilities to investigate into various issues and problems at the local, regional, national and global levels and to make one's own independent assessment;
8. Appreciation of sacrifices and contributions made by the freedom fighters and social workers in India's freedom struggle and social regeneration, and readiness to follow their ideals;
9. Qualities that make a person humane and socially effective, giving meaning and direction to life. These values may be clustered around social/economic and personal/spiritual values;

10. Understanding the diversity in lands and people living in different parts of the country and the country's composite cultural heritage;

11. Appreciation for the need of a balanced synthesis between the change oriented technologies and the continuity of the country's traditions and heritage;

12. Knowledge of and respect for our national symbols and desire and determination to uphold the ideals of national identity and unity;

13. Understanding the positive and the negative impact of the processes of globalization, liberalization and localization in the context of our own country;

14. Knowledge, attitude and habits necessary for keeping physically and mentally fit and strong in conformity with the normal developmental pattern;

15. An awareness of the inherent equality of all and the need for global fraternity with a strong commitment to human values and to social justice;

16. Application of and readiness to practise in life the national goals of socialism, secularism, healthy democracy and non-violence;

17. Qualities and characteristics necessary for self-learning, self-directed learning and life-long learning leading to the creation of a learning society;

18. Ability to discover and appreciate beauty in different life situations, and integrate it into one's own personality;

19. Capacity not only to accumulate factual information but also to understand, reflect and internalize and develop insight;

20. Capability of appreciating and tolerating differences and diversities of various sorts/ideologies and the capacity to choose between alternative value systems.

Scheme of students at Secondary Stage (2 years)

(a) Three Languages

(b) Mathematics

(c) Science and Technology

(d) Social Sciences

(e) We may also consider here whether computer literacy could also be added as one of the subjects (10%) at this stage.

Curriculum at Secondary Stage:

Education in Science and Technology should aim at developing well defined abilities in cognitive, affective and psycho-motor domains such as spirit of inquiry, creativity, objectivity, courage to question and aesthetic sensibility. Therefore, curriculum in Science and Technology should be designed so as to enable the learner to acquire problem solving and decision making skills and to discover the relationship of Science with health, agriculture, industry and other aspects of daily life.

Social Sciences: The study of Social Sciences is of crucial importance as a component of general education at the secondary stage of school

education because it helps in understanding the human environment in its entity and in developing a broader perspective.

Flexibility in ways of thinking, tolerance for different cultures and self-moderation in exercising powers may be pre-requisite to guarantee the diversity of human cultures in future. Information and Communication Technology has provided immense possibilities for the learner to acquire information and to use it. Computers may help learning in Social Sciences by way of providing the following.

Computer aided drill and practice; computer based games, computer simulation and information retrieval. The major issues of the 21st century having relevance for Social Sciences teaching in schools may be as follows:

Poverty, population growth, Food Security, Water Scarcity, Climate Changes and Cultural Preservation. At the end of the secondary stage, the students should be able to show their knowledge, understanding and skills to a wide range of studies at various scale level/regional/national. Teaching of history should be objective and free from any communal, parochial, ideological and other prejudices. The stereotyped images and biases should be avoided in the teaching of Geography as well as other social sciences subjects. Economic and political literacy should be promoted. Along with other audio-visual materials, information technology should be used for effective learning.

Higher Secondary Stage:

It is a transition from general and undifferentiated curriculum to courses of specialized nature. Therefore, curriculum at this stage has a

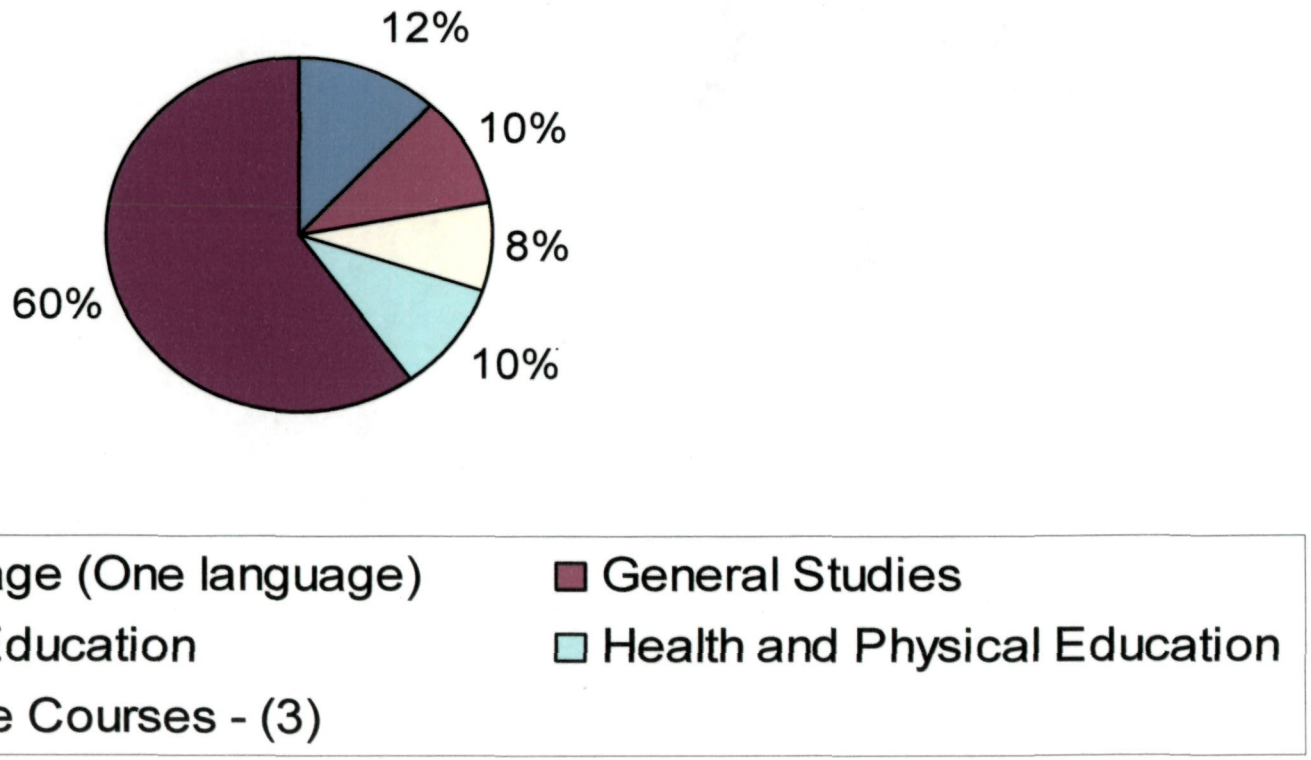
hangover of general education and the challenge of specialization characteristics of the tertiary education. It also recommended semesterization of course at senior secondary stage.

Scheme of studies at Higher Secondary Stage:

The curriculum at this stage comprises (i) common foundation courses, and (ii) elective courses.

1. Language (one language)
2. General Studies
3. Work Education
4. Health and Physical Education
5. Elective Courses (3)

WEIGHTAGE FOR DIFFERENT CURRICULAR AREAS



Information and Communication Technology in Schooling:

Making computers available to increasing number of schools is the very first measure that the Information Technology (IT) Action Plan Proposes. Launching Schemes for easy-installment bank loans and other measures to help students, teachers and schools to buy computers is going to be a major support for the school community.

IT rich schools with substantial technological input have been the other recommendation. The council has worked out a blueprint for smart schools which the MHRD proposes to establish all over the country in limited number.

Table 3.5: A comparative profile of social studies in three generations of curriculum framework.

S.No.	Areas	National Curriculum for Ten years schools, 1975	National curriculum for Elementary and Secondary Education 1988	National Curriculum for School Education-2000
1.	Stages of Schooling	1. Primary 2. Middle 3. Lower Secondary 4. Higher Secondary	Three stages 1. Pre-Primary (2 years) 2. Elementary (8 years) (i) Primary (5 years) (ii) Upper Primary (3 years) 3. Secondary (2 years)	Three stages 1. Pre-Primary (2 years) 2. Elementary (8 years) i) Primary (5 years) (a) Classes I & II (b) Classes III to V ii) Upper Primary (3 years) 3. Secondary (2 years)
2.	Curriculum Areas	Seven Curriculum Areas: 1. The Sciences 2. Maths 3. Work Experience 4. Social Sciences 5. Languages 6. Art, Music and Aesthetic activities 7. Health and Physical Education	Six Curricular Areas 1. Languages 2. Maths 3. Environmental Studies Primary Sciences and Social Sciences and Social Secondary 4. Health and Physical Education 5. Art Education 6. Work Experience	Four Curricular Areas 1. Languages 2. Mathematics 3. Environmental Studies/Social Science, Science and Technology 4. Work Education, Art Education and Health and Physical Education put together and a new subject named as Art of Healthy and Productive Living is introduced at Primary level. Other separate areas at Upper Primary and Secondary level school work education, Art education, Health & Physical Education.
3.	Social Personal Qualities	No specific reference is made. These are not identified at curriculum level stage-wise.	Same as 1975 Curriculum	More details are given regarding EQ and SQ but the social personal qualities are not identified stage-wise.

4.	Social Studies as core subject and its organi-zation	Introduced as core curricular areas at Primary level classes I & II as environmental study. I. Social studies, Environmental study. II. Science introduced at middle class VI to VIII as social science, same at lower secondary and higher secondary	Introduced as core curricular area. 1. At pre-primary stage as a component of educational experiences for social participation. 2. At primary level same as in 1975 curriculum 3. Inclusion of core elements in the curriculum of social science at all levels.	Introduction as core-curricular area. 1. At early childhood education instilling socialization and environmental awareness through some educational experiences. 2. At primary level – classes I & II environment in totality through different subjects. No single area of study called environmental studies is introduced. 3. At upper primary and secondary, it is called social science. 4. Inclusion of core elements in the curriculum of social science at all levels.
5.	Approach of organi-zation of content units	1. Integrated approach at primary level. 2. Three approaches (i) Separate approach at middle, lower secondary and higher secondary level. (ii) Group approach (iii) Integrated approach states are free to choose any one.	1. For Primary level same as in 1975 curriculum. 2. Separate approach at upper primary and secondary level.	1. Primary level – integrated approach. 2. Secondary level – integrated approach. The themes and issues as basis of organization of the content areas.
6.	Teaching strategy	1. A chapter entitled some aspects of the Methodology of education and teaching of subjects is inserted. 2. (i) Integrated approach of teaching environmental studies at primary level	A chapter entitled emerging concerns and imperatives included. 1. at Primary level i) Child-centered approach ii) Teacher as a facilitator iii) Appropriate methods to facilitate interactive process	1. Primary level - integrated approach coupled with activity approach. 2. Secondary level – Integrated way of teaching with greater depth on processes and patterns in the interaction of man with environment. 3. Instructional strategies may assume

		emphasized. (ii) Organization of activities related to community involvement through visits and field trips. 3. No specific strategy is suggested relating middle and secondary stage.	iv) Environmental approach – learning about environment and learning for environment. 2. At secondary level: i) Training in the use of library, audio, video programmes and computerized data bank as part of instructional process. ii) Teaching strategies to stimulate pupils and discover knowledge. iii) Teaching of history should be objective and free from any communical, parochial and other prejudices. iv) Independent work, challenging assignment and project work. v) Practical work in geography. vi) Organizing youth parliament, seminars, discussions, assisted by newspapers and magazines for the study of contemporary problems.	variety of models. i) Activities like observation, demonstration, project, assignment, and fieldwork. ii) Dramatization, Discussion, debate, problem solving, discovering, creative writings. iii) Supplementary reading as the part of instructional strategy. iv) Investigative approach.
7.	Evaluation	No specific reference of any specific procedure in connection with social studies evaluation for any level.	Same as in 1975 curriculum framework	Same as in earlier curriculum frameworks.

Chapter by: Sarla Rajput - Teaching and Learning of Social Studies (p. 323)
" Experiences in School Education", NCERT (p. 323)
By J.S. Rajput, O.S. Dewal, CHK Misra, Puranchand, August 2001.

3.9.1. Conclusion:

This chapter has focused the efforts carried out by the Government of India in Improving the Curriculum of Secondary Schools with special reference to Science, Social Studies and Information Technology. It has outlined the recommendations of committees, commissions and policies brought forward for the enrichment of secondary school curriculum since Independence. Next chapter deals with the Methodology and Design of the study.

CHAPTER 4

DESIGN AND PROCEDURE

4.0.0 Introduction:

As outlined in chapter 1, the present study is a detailed description of the progress of Science Education & Social Sciences in Indian CBSE Schools at secondary level from 1947 to 2005. It also studies the place of Information Technology in the curriculum of secondary schools in India. The present study has been undertaken to review the historical development of curriculum with special reference to Science & Social Studies at Secondary School level in India since Independence and to find out the views of secondary school students and their teachers about the prevalent curriculum of Science, Social Studies and Information Technology in Secondary Schools of few cities of Uttar Pradesh like Agra, Aligarh, Allahabad, Bareilly and Lucknow. In this connection some prevailing conditions and practices were studied. The nature of the present research problem is descriptive. The present chapter focuses on the design and procedure adopted for the purpose and also the sample selected, tools developed and statistical analysis carried out.

4.1.0 Objectives:

To make an in-depth study of the secondary and senior secondary school science and social studies curriculum and the science and social studies NCERT textbooks for classes IX, X, XI & XII of UP in regard to the following aspects.

1. To trace the historical development of curriculum with special reference to social studies and science at secondary school level in India since Independence.
2. To find out how far the schools are making use of Information Technology in the teaching – learning process of the students.

3. To analyse the opinion of lower secondary students of some CBSE schools in UP about the science curriculum prevalent in their schools.
4. To analyse the opinion of lower secondary students of some CBSE schools in UP about the social studies curriculum prevalent in their schools.
5. To find out the opinion of lower secondary school teachers of science about the prevalent curriculum of science in CBSE schools of UP at Secondary School level.
6. To find out the opinion of lower secondary school teachers of social studies about the prevalent curriculum of social studies in CBSE schools of UP.
7. To find out the opinion of senior secondary students of some CBSE schools in UP about the science curriculum prevalent in their schools.
8. To find out the opinion of senior secondary students of some CBSE schools in UP about the social sciences curriculum prevalent in their schools.
9. To find out the opinion of senior secondary school teachers of science (PCB group) about the prevalent science curriculum in CBSE schools of UP at Senior Secondary School level.
10. To find out the opinion of senior secondary school teachers of social sciences about the prevalent social sciences curriculum in CBSE schools of U.P. at senior secondary school level.

4.2.0 Design of the study:

The specific objective behind conducting the present study may be stated in a single statement as "To study the views of secondary school students of CBSE Board and their teachers in U.P. about present position of Science Education, Social Studies and Information Technology at Secondary School stage."

(Koul, Lokesh, 1997) advices that descriptive research studies are designed to obtain pertinent and precise information concerning the current status of phenomenon, and whatever possible, to draw valid general conclusions from the facts discovered. Descriptive method helps to explain educational phenomena in terms of conditions or relationships that exists, opinion and attitudes that are held by the students, teachers, parents and experts, processes that are going on, effects that are evident, or trends that are developing. Because of the apparent ease and directness of this method, investigator can gather information in terms of individual opinion about some issues, by a simple questionnaire. Therefore, descriptive investigations are of immense value in solving problems about children, school organization, supervision and administration, curriculum, teaching methods and evaluation. For carrying on the study besides consulting secondary sources, the main body of the thesis is based on the information collected through primary sources, by means of questionnaires. For the study of secondary sources the investigator has visited NCERT, New Delhi, SCERT, (U.P.), Tagore Library, University of Lucknow, Dr. Zakir Husain Library, Jamia Millia Islamia, New Delhi, Maulana Azad Library, A.M.U., Aligarh, Delhi University, ICSSR, New Delhi and Ministry of Education, New Delhi.

4.2.1 Tools of the study:

Tools of the study were seven types of questionnaires developed by the investigator.

Questionnaire (A) consisted of 20 statements related to the textbooks of science followed by 20 statements related to the textbooks of social studies. This was meant for students of class IX and X to find out their opinion regarding NCERT Science and Social Studies textbooks and Science & Social Studies Curriculum.

Questionnaire (B) was meant for the Science teachers of class IX and X to find out their opinion about the IX and X class NCERT Science textbooks and Science Curriculum.

Questionnaire (C) was constructed for the Social Studies teachers of class IX and X to find out their opinion about the NCERT textbooks they teach and the Social Studies Curriculum.

Questionnaire (D) was developed for the XI and XII class students of Science to find out their opinion about the textbooks of Physics, Chemistry and Biology. It includes statements related to curriculum in Physics, followed by Chemistry and Biology.

Questionnaire (E) was constructed for the XI and XII class teachers of Physics, Chemistry and Biology. It contains items related to the above subjects of class XI and XII NCERT textbooks and Physics, Chemistry and Biology Curriculum.

Questionnaire (F) had statements related to the NCERT textbooks and curriculum in History followed by Geography, Political Science and

Economics. This was given to the students of class XI and XII studying the above- mentioned subjects

Questionnaire (G) had statements related to class XI and XII textbooks of History, Geography, Political Science and Economics Curriculum. This was meant for the teachers teaching any of the above mentioned subjects.

All the above Questionnaires related to curriculum in Science and Social Studies had statements covering various aspects of the subject like textbooks, application of the subject in daily life, use of Information Technology in learning the subject, Interest and attitude of the students, development of skills, method of teaching, Achievement, General awareness of the subject and its social competence.

Types of questions used:

In the present questionnaires, due to wide diversity of the field of research problem, the investigator has used open and closed type questions. The following guidelines were considered while writing the statements.

1. PURPOSE OF QUESTIONNAIRES: The investigator has taken care of the objectives of the research problems and to the best of her knowledge all the questions are relevant to the objectives.
2. LANGUAGE: While writing the statements, due care has been taken about the phrasing, vocabulary and syntax, so as to offer complete and accurate communications.
3. Terms that could easily be misinterpreted like 'how much', 'new', have been avoided.

4. Words like 'frequently', 'occasionally' and rarely etc., have been avoided.
5. Double negatives have been avoided.
6. Double barreled questions have been avoided.
7. Questions are designed to obtain complete response.

Keeping in view the above guidelines an initial pool of 50 questions for each questionnaire were prepared. These were given to subject experts for examining the relevance, content and language of the statements. On the basis of judgement by experts only those statements which had high loading were selected for administration.

Some statements were modified, some others were rejected and a few new ones were added in each questionnaire. This established the validity of the instrument.

After this, the investigator decided to use open-end type of questionnaire keeping in view the nature of the sample used. The questionnaires were administered twice, with a time gap of two months to a small group of students and teachers respectively. By using test-retest method and product moment correlation coefficient, the reliability coefficient was determined. The following results were obtained:

Table 4.1

	No. of cases	**Reliability Coefficient**
Questionnaire A	50	0.83
Questionnaire B	50	0.74
Questionnaire C	20	0.81
Questionnaire D	45	0.74
Questionnaire E	40	0.73
Questionnaire F	25	0.85
Questionnaire G	20	0.76

The questionnaires were reliable because the respondents attempted well and sense was quite normal. To maintain the content validity of the questionnaire the researcher consulted almost all aspects of the subjects.

Thus finally 29 statements in questionnaire A, 29 statements in questionnaire B, 28 in questionnaire C, 57 in questionnaire D, 29 in questionnaire E, 79 in questionnaire F, and 30 in questionnaire G have been selected.

A copy of questionnaires is attached in APPENDIX I to VII.

4.3.0 Sample:

From many cites of Uttar Pradesh, five cities were selected. They were Agra, Aligarh, Allahabad, Bareilly and Lucknow. However despite the most sincere efforts only 4800 questionnaires from students of secondary schools of CBSE Board in U.P. and 600 teachers of secondary schools of CBSE Board in U.P. were received back. The present study is thus based on the information collected from 25 schools in the five cities of U.P.

Again, Secondary Education was divided into Lower Secondary and Higher Secondary Stage.

Class IX and X comprised Lower Secondary Stage and

Class XI and XII came under Higher or Senior Secondary classes.

4.3.1 Sample of students:

In the sample 600 students from class IX and 600 students from class X were chosen. Again, 600 students of class XI belonging to Life Science Group i.e. (PCB) were chosen and 600 students belonging to

social studies stream (Geography, History, Political Science and Economics) were chosen.

Similarly from class XII, 600 students from Life Science Stream (Physics, Chemistry and Biology) and 600 students from Social Science Stream i.e. (History, geography, Political Science and Economics) were chosen.

Sample distribution can be depicted from the following table.

Table 4.2: Showing sample size of students.

Sl. No.	Name of School	N = No. of students taken from class					
		IX	X	XI Science	XI Social Science	XII Science	XII Social Science
1.	Kendriya Vidyalaya Sangathan (KVS), Gomti Nagar, Lucknow	25	25	35	60	35	60
2.	Kendriya Vidyalaya Sangathan, Aliganj, Lucknow	25	25	35	55	35	55
3.	HAL (Hindustan Aeronautics Limited) Lucknow	20	20	30	50	30	50
4.	New Way School, Aliganj, Lucknow	20	20	-	-	-	-
5.	Cathedril Senior Secondary School, Hazratganj, Lucknow	20	20	20	25	20	25
6.	Rani Laxmi Bai Memorial Senior Secondary School, Indira Nagar, Lucknow	25	25	35	45	35	45
7.	Our Lady of Fatima Senior Secondary School, Aligarh	25	25	20	-	20	-
8.	Bal Bharti Public Senior Secondary School, Allahabad	25	25	35	-	35	-

9.	Jagat Taran Golden Jubilee School, George Town, Allahabad	25	25	30	25	30	25
10.	Tagore Public School, Meerapur, Allahabad	25	25	25	50	25	50
11.	M.L. Convent School, Allahabad	25	25	-	-	-	-
12.	Wood Row Senior Secondary School, Bareilly	25	25	35	25	35	25
13.	Manassthali Senior Secondary School, Bareilly	25	25	20	25	20	25
14.	Radha Madhav Public School, Bareilly	25	25	-	-	--	-
15.	Kendriya Vidyalaya, Bareilly	25	25	30	45	30	45
16.	John Milton School, Agra	25	25	-	-	-	-
17.	Delhi Public School, Agra	25	25	-	-	-	-
18.	Asissi Convent School, Agra	10	10	-	-	-	-
19.	Zakir Hussain Model Senior Secondary School, Aligarh	25	25	35	-	35	-
20.	Blue Bird Senior Secondary School, Aligarh	25	25	35	-	35	-
21.	AMU Girls' High School, Aligarh	30	30	45	65	45	65
22.	S.T. High School, AMU, Aligarh	30	30	45	65	45	65
23.	City High School, AMU, Aligarh	30	30	45	65	45	65
24.	Aligarh Public School, Aligarh	25	25	45	-	45	-
25.	Police Modern Senior Secondary School, Lucknow	15	15	-	-	-	-
	Total No. of students	600	600	600	600	600	600

4.3.2 Sample of teachers:

Incident sampling method was adopted for this purpose. Teachers teaching secondary classes in CBSE schools were chosen for this purpose and also teachers undergoing B.Ed. training programme through IGNOU (Indira Gandhi National Open University) were chosen for this purpose. These teachers belonged to schools of different areas in U.P. They were selected at random during the workshops of IGNOU B.Ed. programme.

Remaining teachers were selected from the cities like Agra, Aligarh, Allahabad, Bareilly and Lucknow. Finally 150 teachers of Science each taking classes IX-X were selected. Similarly 150 teachers of social studies each taking classes IX-X were selected. 150 teachers of class XI-XII (Physics, Chemistry and Biology) were selected. Again 150 teachers of class XI-XII social sciences (History, Geography, Political and Economics) were selected. All these teachers constituted sample of the present study. Names of the schools are as follows in Table 4.1.

Table 4.3: Showing sample size of teachers

Sl. No.	Name of School	N = No. of teachers taken from class			
		IX –X Science	IX-X Social Science	XI-XII Science	XI-XII Social Science
1.	Aligarh Public School, Aligarh	3	3	4	-
2.	Our Lady of Fatima Senior Secondary School, Aligarh	3	3	3	-
3.	Blue Bird Senior Secondary School, Aligarh	3	2	3	-

4.	Zakir Hussain Senior Secondary School, Aligarh	3	3	4	-
5.	S.T. High School, Aligarh	4	4	5	5
6.	Girls' High School, AMU, Aligarh.	4	4	3	4
7.	City High School, AMU, Aligarh.	3	3	4	4
8.	John Milton School, Agra	2	2	-	-
9.	Delhi Public School, Agra	2	2	-	-
10.	Asissi Convent School, Agra	1	1	-	-
11.	Bal Bharti Senior Secondary School, Allahabad	2	3	4	-
12.	Tagore Public School, Meerapur, Allahabad	3	3	3	4
13.	M.L. Convent School, Allahabad	2	2	3	-
14.	Jagat Taran Golden Jubilee School, George Town, Allahabad	3	3	3	4
15.	Kendriya Vidyalaya, Bareilly	2	2	3	4
16.	Wood Row Senior Secondary School, Bareilly	2	2	3	3
17.	Manas Sthali Senior Secondary School, Bareilly	2	2	3	2
18.	Radha Madhav Public School, Bareilly	2	2	3	2
19.	Spring Dale College, Bareilly	1	1	2	-
20.	Kendriya Vidyalaya Sangathan (KVS), Gomti Nagar, Lucknow	3	3	4	5

21.	KVS, Aliganj, Lucknow		3	3	4	5
22.	Hindustan Aeronautics Limited (HAL) School, Lucknow		2	3	4	4
23.	New Way School, Aliganj, Lucknow		2	2	3	-
24.	Cathedril Senior Secondary School, Hazratganj, Lucknow		2	2	3	4
25.	Rani Laxmi Bai Senior Secondary School, Indira Nagar, Lucknow		2	1	3	4
26.	Police Modern Senior Secondary School, Police Lines, Faizabad Road, Lucknow		2	2	3	4
	Total		63	63	77	58
27.	Teachers available at Lucknow University during IGNOU B.Ed. Workshop	B.Ed. I yr	20	28	18	19
		B.Ed. II yr	21	15	16	26
28.	Teachers available at AMU, Aligarh during the IGNOU B.Ed. Workshop	B.Ed. I yr	21	25	19	21
		B.Ed. II yr	25	19	20	26
	Total Teachers		**150**	**150**	**150**	**150**

4.4.0 Collection of data:

The investigator personally visited various schools of Aligarh, Allahabad and Lucknow. The data from the schools of Agra and Bareilly was acquired by the teachers and students of the schools by post.

Among many schools in the above mentioned cities only 25 schools listed in Table 4.1 allowed the investigator to collect the data. The investigator is very sorry to say that Principals of some schools refused to provide the data from their schools. This is the reason why the investigator could not collect the data from a very large representative sample. The results therefore have been relied upon only on the data collected from approachable schools. The data so collected has been presented in appropriate tables.

Administration of questionnaire:

After seeking permission from the Principals of schools mentioned above, investigator contacted the students and their teachers of Science and Social Studies of classes IX, X, XI and XII and then explained the objectives of the study, the statements of the questionnaires and clarified their doubts about it. Respondents were assured that the information provided by them would be kept strictly confidential. Then the investigator distributed the questionnaire among the students and their teachers. They were asked to go through the statements carefully and give response to each question. They were also required to give personal information like Name, Class, Name of the School, Place, Sex, Age. Teachers were asked to write down their teaching experience and also the classes they have assessed.

Doubts and confusions were made clear by the investigator before moving to next item. No undue stress and control was applied over the students at the time of completion of the questionnaire. No time limit was fixed for completion of questionnaire, so that the subjects might feel free to respond. On an average basis, one questionnaire took 30-35 minutes for completion.

4.4.1 Organization of data:

The data collected was checked for its accuracy, usefulness and completeness. It was categorized into various groups. Frequency tables were made of each statement. The method of hand sorting and hand tabulation was adopted for classification and tabulation of data respectively. The data was analysed by calculating the frequency of responses and also percentage of responses on each statement. The forthcoming chapter gives a detail of data analysis and interpretation of results.

4.4.2 STATISTICAL TREATMENT:

Students Response

	Students Response	Yes*		No*		Can't say*	
		Freq. of Resp.	%age of Resp.	Freq. of Resp.	%age of Resp.	Freq. of Resp.	%age of Resp.
For classes IX and X	Science Students						
	Social Studies Students						
For classes XI and XII	Physics						
	Chemistry						
	Biology						
	History						
	Geography						
	Political Sc.						
	Economics						

Teachers Response

	Teachers Response	Yes*		No*		Can't say*	
		Freq. of Resp.	%age of Resp.	Freq. of Resp.	%age of Resp.	Freq. of Resp.	%age of Resp.
For classes IX and X	Science						
	Social Studies						
For classes XI and XII	Physics						
	Chemistry						
	Biology						
	History						
	Geography						
	Political Science						
	Economics						

* There could be other options in each item instead of Yes, No and can't say depending upon the statement.

By the above shown method students' response and Teachers' response on each item is calculated. Then the Frequency of Response and its percentage is calculated for each option.

4.5.0 Conclusion:

This chapter has outlined the specific objectives of the study, the design employed, sample selected, tools developed and used, and the procedure carried out for collecting data. Next chapter presents the results emerging from the data collected and analysed through appropriate scientific methods and also the interpretation of results.

CHAPTER 5

ANALYSIS AND INTERPRETATION OF DATA

5.0.0 Introduction:

The preceding chapter catalogues the procedural details of the methodology followed in conducting the experiment. This chapter deals with the collection of data, their statistical analysis and interpretation. Statistical analysis is the process of gathering, organizing, analyzing and interpreting numerical data and is one of the basic phases of the research process.

Collection of data:

The tools used in this study for the collection of data are seven self prepared questionnaires, out of which three were for students and four for the teachers.

Questionnaire (A) for class IX-X students.

Questionnaire (D) for students of science (PCB) and Questionnaire (F) for social science group of classes XI-XII.

Questionnaire (B) for teachers of science and Questionnaire (C) for teachers of social studies of class IX-X.

Questionnaire (E) for teachers of science and Questionnaire (G) for teachers of social science group of classes XI and XII.

All the above forms of Questionnaires can be seen from Appendix.

Data collected through these questionnaires intends to assess the success of the relevance of the curriculum in Science and Social Studies by knowing the opinion of students and teachers of secondary schools of CBSE Board in U.P. and also the use of Information Technology in them.

These questionnaires were administered to the students and teachers to know their opinion on the statements related to the curriculum in science and social studies and use of IT. Percentage and frequency of response of each statement was calculated and is shown as follows under 'Analysis of Data':

5.1.0 ANALYSIS OF DATA:

5.1.1 Given below are the responses of class IX students towards the statements given in Questionnaire (A) about Science & Technology and Social Studies Curriculum.

TABLE 5.1

Item No. 1: Your textbook is

Students response towards	Easy		Difficult		Apt (understandable)	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science textbook	86	14.333	88	14.667	426	71.000
Social Studies textbook	98	16.333	154	25.667	348	58.000

Item No. 2: Subject matter in the textbook is

Students response towards	Interesting		Not V. Interesting		Boring	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science textbook	314	52.333	172	28.667	114	19.000
Social Studies textbook	220	36.667	340	56.667	40	06.667

Item No. 3: The syllabus of textbook is

Students response towards	Lengthy		Short		Apt (understandable)	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science textbook	394	65.667	70	11.667	136	22.667
Social Studies textbook	428	71.333	21	03.500	151	25.167

Item No. 4: The curriculum in Science and Technology is

Students response towards	Wide and comprehensive		Narrow and limited		Heavy and burdensome	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science Curriculum	218	36.333	28	04.667	354	59.000
Social Studies Curriculum	155	25.833	25	04.167	420	70.000

Item No. 5: Curriculum is

Students response towards	Flexible		Rigid		Dynamic	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science Curriculum	382	63.667	186	31.000	32	05.333
Social Studies Curriculum	140	23.333	236	39.333	224	37.333

Item No. 6: With which of the following statements do you agree?

Students response towards	Studying Science & Tech is more beneficial for students		Studying Phy, Chem & Bio separately is more beneficial for students		Both approaches are equally good	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science course	222	37.000	192	32.000	186	31.000
Social Studies course	222	37.000	248	41.333	130	21.667

Item No. 7: Class IX Science & Social Studies course is integrated with IT (Information Technology)

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science course	450	75.000	105	17.500	45	7.500
Social Studies course	152	25.333	396	66.000	52	08.667

Item No. 8: It is correlated with other subjects

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science course	500	83.333	80	13.333	20	3.333
Social Studies course	234	39.000	325	54.167	41	06.833

Item No. 9: It provides you with sufficient material on the subject

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science textbook	457	76.167	140	23.333	03	0.500
Social Studies textbook	479	79.833	108	18.000	13	02.167

Item No. 10: Time frame of the school is sufficient enough to cover the course content

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science course	402	67.000	190	31.667	08	01.333
Social Studies course	261	43.500	328	54.667	11	01.833

Item No. 11: It is related to community living

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science curriculum	513	85.500	61	10.167	26	04.333
Social Studies curriculum	225	37.500	243	40.500	132	22.000

Item No. 12: It is complete in itself

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science curriculum	554	92.333	31	05.167	15	02.500
Social Studies curriculum	463	77.167	121	20.167	16	02.667

Item No. 13: The language of textbook is lucid, simple and precise

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science textbook	563	93.833	33	05.500	04	0.667
Social Studies textbook	358	59.667	228	38.000	14	02.333

Item No. 14: It contains necessary examples, figures, graphs etc.

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science textbook	276	46.000	290	48.333	34	05.667
Social Studies textbook	372	62.000	219	36.500	09	01.500

Item No. 15: The experiments in Physics, Chemistry and Biology are feasible to be performed in your school laboratory

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science course	554	92.333	40	06.667	06	01.000

Item No. 16: There should be two sets of curricula one advanced and the other ordinary in Science and Technology for class IX and X students to choose any one of them.

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science curriculum	406	67.667	171	28.500	23	03.833

Item No. 17: Science curriculum develops economic efficiency and capacity to earn livelihood.

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science curriculum	250	41.667	299	49.833	51	08.500

Item No. 18: Science course increases curiosity and power of reasoning and observation.

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science curriculum	378	63.000	205	34.167	17	02.833

Item No. 19: Science curriculum encourages learning by doing.

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science curriculum	554	92.333	31	05.167	15	02.500

Item No. 20: Science course explains happening of natural phenomenon around us.

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science course	463	77.167	108	18.000	29	04.833

Item no's 15, 16, 17, 18, 19 and 20 are related to Science and technology textbook only.

Item No. 21: The Social Studies curriculum inculcates love for cultural values.

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Social studies curriculum	428	71.333	153	25.500	19	03.167

Item No. 22: Social studies curriculum develops sense of appreciation.

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Social studies curriculum	289	48.167	278	46.333	33	05.500

Item No. 23: Social studies curriculum creates national awareness and promotes international understanding.

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Social studies curriculum	261	43.500	298	49.667	41	06.833

Item No. 24: Social studies curriculum provides social competence.

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Social studies curriculum	312	52.000	260	43.333	28	04.667

Item No. 25: Social studies curriculum is experience based (i.e. it contains a series of activities and skills).

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Social studies curriculum	237	39.500	346	57.667	17	02.833

Item No. 26: Social studies curriculum enables you to resolve your contemporary social and individual problems.

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Social studies curriculum	218	36.333	363	60.500	19	03.167

Item numbers 21, 22, 23, 24, 25 and 26 are related to social studies curriculum only.

5.1.2 Given below are the responses of class X students towards the statements given in Questionnaire (A) about Science & Technology and Social Studies Curriculum.

TABLE 5.2

Item No. 1: Your textbook is

Students response towards	Easy		Difficult		Apt	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science textbook	151	25.167	148	24.667	301	50.167
Social Studies textbook	111	18.500	192	32.000	297	49.500

Item No. 2: Subject matter in the textbook is

Students response towards	Interesting		Not V. Interesting		Boring	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science textbook	413	68.833	148	24.667	39	6.500
Social Studies textbook	230	38.333	289	48.167	81	13.500

Item No. 3: The syllabus in textbook is

Students response towards	Lengthy		Short		Apt (understandable)	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science textbook	326	54.333	54	09.000	220	36.667
Social Studies textbook	407	67.833	31	05.167	162	27.000

Item No. 4: The curriculum in Science and Technology is

Students response towards	Wide and comprehensive		Narrow and limited		Heavy and burdensome	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science curriculum	326	54.333	52	08.667	222	37.000
Social Science curriculum	178	29.667	59	09.833	363	60.500

Item No. 5: Curriculum is

Students response towards	Flexible		Rigid		Dynamic	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science curriculum	282	47.000	154	25.667	164	27.333
Social Science curriculum	203	33.833	201	33.500	196	32.667

Item No. 6: With which of the following statements do you agree?

Students response towards	Studying Science & Tech is more beneficial for students		Studying Phy, Chem & Bio separately is more beneficial for students		Both approaches are equally good	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science course	97	16.167	281	46.833	222	37.000
Social Studies course	194	32.333	205	34.167	201	33.500

Item No. 7: Class X Science & Technology course and Social Studies course is integrated with IT (Information Technology)

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science course	177	29.500	374	62.333	49	08.167
Social Studies course	176	29.333	234	39.000	190	31.667

Item No. 8: It is correlated with other subjects

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science course	207	34.500	342	57.000	51	08.500
Social Studies course	202	33.667	301	50.167	97	16.167

Item No. 9: It provides you with sufficient material on the subject

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science textbook	354	59.000	215	35.833	31	05.167
Social Studies textbook	189	31.500	324	54.000	87	14.500

Item No. 10: Time frame of the school is sufficient enough to cover the course content

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science course	371	61.833	205	34.167	24	04.000
Social Studies courses	230	38.333	258	43.000	112	18.667

Item No. 11: It is related to community living

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science curriculum	287	47.833	293	48.833	20	03.333
Social Studies curriculum	279	46.500	286	47.667	35	05.833

Item No. 12: It is complete in itself

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science curriculum	298	49.667	243	40.500	59	09.833
Social Studies curriculum	299	49.833	252	42.000	49	08.167

Item No. 13: The language of textbook is lucid, simple and precise

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science textbook	404	67.333	181	30.167	15	02.500
Social Studies textbook	343	57.167	249	41.500	08	01.333

Item No. 14: It contains necessary examples, figures, graphs etc.

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science textbook	279	46.500	258	43.000	63	10.500
Social Studies textbook	297	49.500	281	46.833	22	03.667

Item No. 15: The experiments in Physics, Chemistry and Biology are feasible to be performed in your school laboratory

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science course	401	66.833	146	24.333	53	08.833

Item No. 16: There should be two sets of curricula one advanced and the other ordinary in Science and Technology for class IX and X students to choose any one of them.

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science curriculum	398	66.333	185	30.833	17	02.833

Item No. 17: Science curriculum develops economic efficiency and capacity to earn livelihood.

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science curriculum	288	48.000	258	43.000	54	09.000

Item No. 18: Science curriculum increases curiosity and power of reasoning and observation.

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science curriculum	274	45.667	254	42.333	72	12.000

Item No. 19: Curriculum in Science encourages learning by doing.

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science curriculum	173	28.333	343	57.167	84	14.000

Item No. 20: Science Curriculum explains happening of natural phenomenon around us.

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science curriculum	255	42.500	317	52.833	28	04.667

Item no's 15, 16, 17, 18, 19 and 20 are related to Science and technology textbook only.

Item No. 21: The Social Studies curriculum inculcates love for cultural values.

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Social students curriculum	239	39.833	243	40.500	118	19.667

Item No. 22: Social studies curriculum develops sense of appreciation.

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science students	274	45.667	270	45.000	56	09.333

Item No. 23: Social studies curriculum creates national awareness and promotes international understanding.

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Social Studies curriculum	238	39.667	261	43.500	101	16.833

Item No. 24: Social studies curriculum provides social competence.

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Social Studies curriculum	280	46.667	207	34.500	113	18.833

Item No. 25: Social studies curriculum is experience based (i.e. it contains a series of activities and skills).

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Social Studies curriculum	435	72.500	117	19.500	48	08.000

Item No. 26: Social studies curriculum enables you to resolve your contemporary social and individual problems.

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Social Studies curriculum	194	32.333	303	50.500	103	17.167

Item numbers 21, 22, 23, 24, 25 and 26 are related to social studies curriculum only.

5.1.3 Given below are the responses of class IX and X teachers of Science & Technology towards the statements given in Questionnaire (B) and teachers of Social Studies given in Questionnaire (C) about their respective Curriculum.

TABLE 5.3

Item No. 1: Textbook for students is

Teachers response towards	Easy		Difficult		Apt	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science textbook	67	44.667	23	15.33	60	40.000
Social Studies textbook	53	35.333	17	11.333	80	53.333

Item No. 2: Subject matter in the textbook is

Teachers response towards	Interesting		Not V. Interesting		Boring	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science textbook	108	72.000	42	28.000	00	0.000
Social Studies textbook	106	70.667	38	25.333	06	4.000

Item No. 3: Syllabus of new course of NCERT/CBSE when compared with the old course is

Teachers response towards	Entirely different		Not much different		Not at all different	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science course	05	3.333	108	72.000	37	24.667
Social Studies course	87	58.000	57	38.000	06	4.000

Item No. 4: The syllabus of textbook is

Teachers response towards	Lengthy		Short		Appropriate	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science textbook	98	65.333	07	4.667	45	30.000
Social Studies textbook	97	64.667	09	6.000	44	29.333

Item No. 5: The curriculum in Science and Technology is

Teachers response towards	Wide and comprehensive		Narrow and limited		Heavy and burdensome	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science curriculum	113	75.333	03	2.000	34	22.667
Social Studies curriculum	98	65.333	07	4.667	45	30.000

Item No. 6: Curriculum is

Teachers response towards	Flexible		Rigid		Dynamic	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science curriculum	99	66.000	09	6.000	42	28.000
Social Studies curriculum	88	58.667	24	16.000	38	25.333

Item No. 7: With which of the following statements do you agree

Teachers response towards	Studying Science & Tech is more beneficial for students		Studying Phy, Chem & Bio separately is more beneficial for students		Both approaches are equally good	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science textbook	10	6.667	108	72.000	32	21.333
Social Studies textbook	20	13.333	120	80.000	10	6.667

Item No. 8: Science and technology course is integrated with IT (Information Technology)

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science course	85	56.667	44	29.333	21	14.000
Social Studies course	15	10.000	122	81.333	13	8.667

Item No. 9: It is correlated with other subjects

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science course	87	58.000	55	36.667	08	5.333
Social Studies course	75	50.000	54	36.000	21	14.000

Item No. 10: It provides you with sufficient material on the subject

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science textbook	132	88.000	10	6.667	08	5.333
Social Studies textbook	138	92.000	04	2.667	08	5.333

Item No. 11: Time frame of the school is sufficient enough to cover the course content

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science course	44	29.333	93	62.000	13	8.667
Social Studies course	54	36.000	79	52.667	17	11.333

Item No. 12: New course is better than the old course in providing social competence in students

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science course	82	27.333	51	34.000	17	05.666
Social Studies course	72	48.000	60	40.000	18	12.000

Item No. 13: It is related to community living

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science curriculum	32	21.333	113	75.333	05	3.333
Social Studies curriculum	43	28.667	91	60.667	16	10.667

Item No. 14: The prescribed curriculum helps develop in students attitude and skills required at secondary school level.

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science curriculum	128	85.333	19	12.667	03	2.000
Social Studies curriculum	81	54.000	56	37.333	13	8.667

Item No. 15: It is complete in itself.

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science curriculum	134	89.333	15	10.000	01	0.667
Social Studies curriculum	111	74.000	31	20.667	08	5.333

Item No. 16: The language of textbook is lucid, simple and precise.

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science textbook	63	42.000	87	58.000	00	0.000
Social Studies textbook	33	22.000	112	74.667	05	3.333

Item No. 17: It contains necessary examples, figures, graphs etc.

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science textbook	78	52.000	66	44.000	06	4.000
Social Studies textbook	61	40.667	78	52.000	11	7.333

Item No. 18: The curriculum is sensitive to changing technology and social needs.

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science curriculum	95	63.333	53	35.333	02	1.333

Item No. 19: It encourages learning by doing.

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science curriculum	108	72.000	35	23.333	07	4.667

Item No. 20: It develops in students economic efficiency and capacity to earn livelihood.

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science curriculum	101	67.333	37	24.667	12	8.000

Item No. 21: It increases curiosity and power of reasoning and observation among students.

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science course	137	91.333	09	6.000	04	2.667

Item No. 22: It provides the scientific outlook (free from prejudices and based on tolerance).

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science curriculum	143	95.333	06	4.000	01	0.667

Item No. 23: It helps in building up of proper development of personality in students.

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science curriculum	114	76.000	29	19.333	07	4.667

Item No. 24: It has utility in the practical life of students.

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science curriculum	52	34.667	78	52.000	20	13.333

Item No. 25: It makes proper exercise of mental discipline in children.

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science course	136	90.667	09	6.000	05	3.333

Item No. 26: It develops sense of appreciation

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science course	129	86.000	17	11.333	04	2.667

Item No. 27: It is based on Psychological principles of learning.

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science course	143	95.333	06	4.000	01	0.667

Item No. 28: There should be two sets of curricula one advanced and the other ordinary in Science and Technology for class IX and X students to choose any one of them.

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science textbook	72	48.000	75	50.000	03	2.000

Item No. 29: Can the objectives of new syllabus be achieved under present conditions and circumstances?

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Science curriculum	144	96.000	02	1.333	04	2.667

Item No. 30: Curriculum in social studies is sensitive to changing needs and values of the society.

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Social Studies curriculum	59	39.333	74	49.333	17	11.333

Item No. 31: The social studies curriculum is experience based (i.e. it contains a series of activities and skills)

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Social Studies curriculum	72	48.000	45	30.000	33	22.000

Item No. 32: It will enable the students to gain insight into spiritual, economic and political values

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Social Studies curriculum	78	52.000	55	36.667	17	11.333

Item No. 33: It helps children develop an insight into human relationships, social values and attitudes

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Social Studies curriculum	113	75.333	33	22.000	04	2.667

Item No. 34: It intends to promote the values and ideals of humanism, secularism, socialism and democracy.

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Social Studies course	52	34.667	78	52.000	20	13.333

Item No. 35: It provides functional relationships among different branches of social sciences.

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Social Studies course	84	56.000	39	26.000	27	18.000

Item No. 36: It helps in building intelligent democratic citizenship in students.

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Social Studies course	78	52.000	62	41.333	10	6.667

Item No. 37: Course content of new syllabus when compared with the old syllabus is.

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Social Studies course	68	45.333	04	2.667	78	52.000

Item No. 38: It is based on psychological principles of learning.

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Social Studies course	85	56.667	59	39.333	06	4.000

Item No. 39: It develops in students sense of appreciation.

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Social Studies course	69	46.000	60	40.000	21	14.000

Item No. 40: It helps develop national awareness and international understanding.

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Social Studies curriculum	72	48.000	65	43.333	13	8.667

Item No. 41: Can the objectives of new syllabus be achieved under present conditions and circumstances?

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Social Studies course	145	96.667	02	1.333	03	2.000

Item Nos. 18 to 29 are based on Science & Technology course only.

Item Nos. 30 to 41 are based on Social Studies course only.

5.1.4 Given below are the responses of class XI students of PCB towards the statements given in Questionnaire (D) about Physics, Chemistry and Biology Curriculum.

TABLE 5.4

(1) The content of the textbook is

Students response towards	Easy		Difficult		Apt (understandable)	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	148	24.667	250	41.667	202	33.667
Chemistry	148	24.667	146	24.333	306	51.000
Biology	73	12.167	129	21.500	398	66.333
Total	369	20.5	525	29.166	906	50.333

(2) Subject matter in the textbook is

Students response towards	Interesting		Not very interesting		Boring	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	210	45.000	267	44.500	123	20.500
Chemistry	212	35.333	268	44.667	120	20.000
Biology	421	70.167	158	26.333	21	3.500
Total	843	46.833	693	38.5	264	14.667

(3) Textbooks are

Students response towards	Lengthy		Short		Appropriate	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	257	42.833	43	7.167	300	50.000
Chemistry	292	48.667	92	15.333	216	36.000
Biology	396	66.000	06	1.000	198	33.000
Total	945	52.5	141	7.833	714	39.666

(4) Curriculum is

Students response towards	Wide & comprehensive		Narrow and limited		Heavy and burdensome	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	264	44.000	89	14.833	247	41.167
Chemistry	312	52.000	67	11.167	221	36.833
Biology	399	66.500	05	0.833	196	32.667
Total	975	54.166	161	8.944	664	36.888

(5) Textbooks are

Students response towards	Cheap		Affordable		Costly	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	42	7.000	363	60.500	195	32.500
Chemistry	175	29.167	227	37.833	198	33.000
Biology	150	25.000	292	48.667	158	26.333
Total	367	20.388	882	49.000	551	30.611

(6) Semesterization of course for class XI is

Students response towards	Beneficial		Not very beneficial		Semester pattern and annual pattern of studies are equally good	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	216	36.000	203	33.833	181	30.167
Chemistry	284	47.333	229	38.167	87	14.500
Biology	296	49.333	208	34.667	96	16.000
Total	796	44.222	640	35.555	364	20.222

(7) Your syllabus is integrated with Information Technology

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	216	36.000	315	52.500	69	11.500
Chemistry	244	40.667	284	47.333	72	12.000
Biology	170	28.333	394	65.667	36	06.000
Total	630	35.000	993	55.166	177	09.833

(8) Physics, Chemistry and Biology curriculum is mutually correlated

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	286	47.667	261	43.500	53	8.833
Chemistry	316	52.667	218	36.333	66	11.000
Biology	191	31.833	363	60.500	46	7.667
Total	793	44.055	842	46.777	165	09.166

(9) Textbooks provide you with sufficient material on the subject

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	367	61.167	220	36.667	13	2.167
Chemistry	513	85.500	70	11.667	17	2.833
Biology	292	48.667	258	43.000	50	8.333
Total	1172	65.111	548	30.444	80	04.444

(10) Time frame of the school is sufficient enough to cover the course content of the textbooks.

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	234	39.000	343	57.167	23	3.833
Chemistry	370	61.667	205	34.167	25	4.167
Biology	172	28.667	400	66.667	28	4.667
Total	776	43.111	948	52.666	76	04.222

(11) Curriculum is sufficient enough to develop scientific attitude and skills required at senior secondary school level

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	413	68.833	172	28.667	15	2.500
Chemistry	555	92.500	40	6.667	05	0.833
Biology	417	69.500	170	28.333	13	2.167
Total	1385	76.944	382	21.222	33	01.833

(12) Curriculum is complete in itself

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	407	67.833	170	28.333	23	3.833
Chemistry	463	77.167	118	19.667	19	3.167
Biology	526	87.667	33	5.500	41	6.833
Total	1396	77.555	321	17.833	83	04.611

(13) Curriculum is community based

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	316	52.667	265	44.167	19	3.167
Chemistry	261	43.500	331	55.167	08	1.333
Biology	276	46.000	220	36.667	104	17.333
Total	853	47.388	816	45.333	131	07.277

(14) Curriculum encourages learning by doing

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	444	74.000	149	24.833	07	1.167
Chemistry	373	62.167	193	32.167	34	5.667
Biology	241	40.167	230	38.333	129	21.500
Total	1058	58.777	572	31.777	170	09.444

(15) The language of textbook is lucid, simple and precise

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	473	78.833	127	21.167	00	0.000
Chemistry	443	73.833	152	25.333	05	0.833
Biology	416	69.333	168	28.000	16	2.667
Total	1332	74.000	447	24.833	21	01.166

(16) The textbooks contain necessary examples, figures, graphs, etc.

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	396	66.000	201	33.500	03	0.500
Chemistry	322	53.667	255	42.500	23	3.833
Biology	358	59.667	79	13.167	163	27.167
Total	1076	59.777	535	29.722	189	10.500

(17) Prescribed curriculum increases curiosity and power of reasoning and observation

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	526	87.667	55	9.167	19	3.167
Chemistry	314	52.333	260	43.333	26	04.333
Biology	246	41.000	290	48.333	64	10.667
Total	1086	60.333	605	33.611	109	06.055

(18) Experiments given in the textbooks are feasible to be performed in your school laboratory

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	319	53.167	258	43.000	23	3.833
Chemistry	307	51.167	280	46.667	13	2.167
Biology	407	67.833	156	26.000	37	6.167
Total	1033	57.388	694	38.555	73	04.055

(19) The new course is sufficient enough to help you compete All India Medical, Engineering and other entrance examinations

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	506	84.333	82	13.667	12	2.000
Chemistry	289	48.167	284	47.333	27	4.500
Biology	329	54.833	213	35.500	58	9.667
Total	1124	62.444	579	32.166	97	05.388

5.1.5 Given below are the responses of class XII students of PCB towards the statements given in Questionnaire (D) about Physics, Chemistry and Biology Curriculum.

TABLE 5.5

(1) The content of the textbook is

Students response towards	Easy		Difficult		Apt (understandable)	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	186	31.000	178	29.667	236	39.333
Chemistry	84	14.000	113	18.833	403	67.167
Biology	117	19.500	42	7.000	441	73.500
Total	387	21.50	233	12.944	1080	60.000

(2) Subject matter in the textbook is

Students response towards	Interesting		Not very interesting		Boring	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	316	52.667	256	42.667	28	4.667
Chemistry	270	45.000	233	38.833	97	16.167
Biology	439	73.167	141	23.500	20	3.333
Total	1025	56.944	630	35.000	145	08.055

(3) Textbooks are

Students response towards	Lengthy		Short		Appropriate	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	216	36.000	66	11.000	318	53.000
Chemistry	217	36.167	76	12.667	307	51.167
Biology	423	70.500	18	3.000	159	26.500
Total	856	47.555	160	08.888	784	43.555

(4) Curriculum is

Students response towards	Wide & comprehensive		Narrow and limited		Heavy and burdensome	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	301	50.167	106	17.667	193	32.167
Chemistry	349	58.167	58	9.667	193	32.167
Biology	396	66.000	28	4.667	176	29.333
Total	1046	58.111	192	10.666	562	31.222

(5) Textbooks are

Students response towards	Cheap		Affordable		Costly	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	93	15.500	378	63.000	129	21.500
Chemistry	186	31.000	301	50.167	113	18.833
Biology	210	35.000	312	52.000	78	13.000
Total	489	27.166	991	55.055	320	17.777

(6) Semesterization of course for class XI and XII is

Students response towards	Beneficial		Not very beneficial		Semester pattern and annual pattern of studies are equally good	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	312	52.000	82	13.667	206	34.333
Chemistry	263	43.833	178	29.667	159	26.500
Biology	251	41.833	246	41.000	103	17.167
Total	826	45.888	506	28.111	468	26.000

(7) Your syllabus is integrated with Information Technology

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	122	20.333	406	67.667	72	12.000
Chemistry	231	38.500	273	45.500	96	16.000
Biology	196	32.667	369	61.500	35	5.833
Total	549	30.500	1048	58.222	203	11.277

(8) Physics, Chemistry and Biology curriculum is mutually correlated

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	312	52.000	225	37.500	63	10.500
Chemistry	347	57.833	194	32.333	59	9.833
Biology	176	29.333	373	62.167	51	8.500
Total	835	46.388	792	44.000	173	9.611

(9) Textbooks provide you with sufficient material on the subject

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	401	66.833	170	28.333	29	4.833
Chemistry	401	66.833	176	29.333	23	3.833
Biology	273	45.500	283	47.167	44	7.333
Total	1075	59.722	629	34.944	96	05.333

(10) Time frame of the school is sufficient enough to cover the course content of the textbooks.

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	321	53.500	252	42.000	27	4.500
Chemistry	311	51.833	272	45.333	17	2.833
Biology	398	66.333	175	29.167	27	4.500
Total	1030	57.222	699	38.833	71	03.944

(11) Curriculum is sufficient enough to develop scientific attitude and skills required at senior secondary school level

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	328	54.667	243	40.500	29	04.833
Chemistry	423	70.500	128	21.333	49	08.167
Biology	297	49.500	285	47.500	18	03.000
Total	1048	58.222	656	36.444	96	05.333

(12) Curriculum is complete in itself

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	350	58.333	191	31.833	59	09.833
Chemistry	482	80.333	107	17.833	11	01.833
Biology	432	72.000	129	21.500	39	06.500
Total	1264	70.222	427	23.722	109	06.055

(13) Curriculum is community based

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	268	44.667	305	50.833	27	4.500
Chemistry	206	34.333	317	52.833	77	12.833
Biology	251	41.833	271	45.167	78	13.000
Total	725	40.277	893	49.611	182	10.111

(14) Curriculum encourages learning by doing

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	572	95.333	15	2.500	13	2.167
Chemistry	317	52.833	227	37.833	56	9.333
Biology	287	47.833	251	41.833	62	10.333
Total	1176	65.333	493	27.388	131	07.277

(15) The language of textbook is lucid, simple and precise

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	498	83.000	91	15.167	11	01.833
Chemistry	450	75.000	123	20.500	27	04.500
Biology	423	70.500	164	27.333	13	02.167
Total	1371	76.166	378	21.000	51	02.833

(16) The textbooks contain necessary examples, figures, graphs, etc.

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	217	36.167	360	60.000	23	3.833
Chemistry	271	45.167	277	46.167	52	8.667
Biology	404	67.333	164	27.333	32	5.333
Total	892	49.555	801	44.500	107	05.944

(17) Prescribed curriculum increases curiosity and power of reasoning and observation

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	328	54.667	207	34.500	65	10.833
Chemistry	308	51.333	260	43.33	32	05.333
Biology	286	47.667	254	42.333	60	10.000
Total	922	51.222	721	40.055	157	08.722

(18) Experiments given in the textbooks are feasible to be performed in your school laboratory

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	345	57.500	227	37.833	28	04.667
Chemistry	301	50.167	285	47.500	14	02.333
Biology	448	74.667	129	21.500	23	03.833
Total	1094	60.777	641	35.611	65	03.611

(19) The new course is sufficient enough to help you compete All India Medical, Engineering and other entrance examinations

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	438	73.000	145	24.167	17	2.833
Chemistry	317	52.833	265	44.167	18	3.000
Biology	358	59.666	223	37.166	19	3.166
Total	1113	61.833	633	35.166	54	03.000

5.1.6 Given below are the responses of Science (Physics, Chemistry and Biology) teachers of class XI-XII towards the statements given in Questionnaire (E) about their respective curriculum.

TABLE 5.6

(1) The content of the textbook is

Teachers response towards	Easy		Difficult		Apt (understandable)	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	21	14.000	93	62.000	36	24.000
Chemistry	25	16.667	53	35.333	72	48.000
Biology	65	43.333	43	28.667	42	28.000
Total	111	24.666	189	41.958	150	33.300

(2) Subject matter in the textbook is

Teachers response towards	Interesting		Not very interesting		Boring	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	104	69.333	41	27.333	05	03.333
Chemistry	113	75.333	34	22.667	03	02.000
Biology	113	75.333	33	22.000	04	02.667
Total	330	73.26	108	23.976	12	02.664

(3) New course when compared with old course is

Teachers response towards	Entirely different		Not much different		Not at all different	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	45	30.000	92	61.333	13	8.667
Chemistry	23	15.333	106	70.667	21	14.000
Biology	89	59.333	47	31.333	14	9.333
Total	157	34.854	245	54.39	48	10.656

(4) Textbooks are

Teachers response towards	Lengthy		Short		Appropriate	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	84	56.000	05	03.333	61	40.667
Chemistry	93	62.000	03	02.000	54	36.000
Biology	94	62.667	05	03.333	51	34.000
Total	271	60.162	13	02.886	166	36.852

(5) Curriculum is

Teachers response towards	Wide and comprehensive		Narrow and limited		Heavy and burdensome	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	85	56.667	07	4.667	58	38.667
Chemistry	106	70.667	02	1.333	42	28.000
Biology	110	73.333	04	2.667	36	24.000
Total	301	66.822	13	2.886	136	30.192

(6) The curriculum is

Teachers response towards	Flexible		Rigid		Dynamic	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	112	74.667	10	6.667	28	18.667
Chemistry	130	86.667	12	8.000	08	5.333
Biology	134	89.333	03	2.000	13	8.667
Total	376	83.472	25	05.550	49	10.878

(7) New course when compared with old course is

Teachers response towards	More difficult		Less difficult		Of the same difficulty level	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	83	55.333	05	3.333	62	41.333
Chemistry	96	64.000	01	0.667	53	35.333
Biology	96	64.000	04	2.667	50	33.333
Total	275	61.05	10	02.220	165	36.630

(8) Your syllabus is integrated with Information Technology

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	105	70.000	34	22.667	11	07.333
Chemistry	48	32.000	85	56.667	17	11.333
Biology	85	56.667	54	36.000	11	07.333
Total	238	52.836	173	38.406	39	08.658

(9) Physics, Chemistry and Biology curricula are mutually correlated

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	62	41.333	56	37.333	32	21.333
Chemistry	65	43.333	63	42.000	22	14.667
Biology	102	68.000	35	23.333	13	8.667
Total	229	50.838	154	34.188	67	14.874

(10) Textbooks provide students with sufficient material on the subject

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	78	52.000	61	40.667	11	7.333
Chemistry	103	68.667	41	27.333	06	4.000
Biology	74	49.333	43	28.667	33	22.000
Total	165	36.63	145	32.19	50	11.100

(11) Time frame of the school is sufficient enough to cover the course content in the textbooks

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	64	42.667	63	42.000	23	15.333
Chemistry	27	18.000	95	63.333	28	18.667
Biology	54	36.000	78	52.000	18	12.000
Total	145	32.190	236	52.392	69	15.318

(12) New course is better than the old course in providing social competence in students.

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	78	52.000	57	38.000	15	10.000
Chemistry	78	52.000	38	25.333	34	22.667
Biology	103	68.667	23	15.333	24	16.000
Total	259	57.498	118	26.196	73	16.206

(13) It is related to community living

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	65	43.333	56	37.333	29	19.333
Chemistry	75	50.000	57	38.000	18	12.000
Biology	79	52.667	34	22.667	37	24.667
Total	219	48.618	147	32.634	84	18.648

(14) Curriculum is sufficient enough to develop scientific attitude and skills in pupils required at senior secondary school level

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	108	72.000	30	20.000	12	8.000
Chemistry	134	89.333	05	3.333	11	7.333
Biology	122	81.333	16	10.667	12	8.000
Total	364	80.000	51	11.322	35	07.770

(15) Curriculum is complete in itself

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	126	84.000	06	4.000	18	12.000
Chemistry	137	91.333	06	4.000	07	4.667
Biology	113	75.333	19	12.667	18	12.000
Total	376	83.472	31	06.882	43	09.546

(16) The language of textbook is lucid, simple and precise

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	108	72.000	37	24.667	05	3.333
Chemistry	68	45.333	64	42.667	18	12.000
Biology	77	51.333	64	42.667	09	6.000
Total	253	56.166	165	36.63	32	07.104

(17) The textbooks contain necessary examples, figures, graphs etc.

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	48	32.000	61	40.667	41	27.333
Chemistry	94	62.667	41	27.333	15	10.000
Biology	113	75.333	16	10.667	21	14.000
Total	255	56.610	118	26.196	77	17.094

(18) It develops in pupils the desired skills for solving problems in their day-to-day life.

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	76	50.667	48	32.000	26	17.333
Chemistry	76	50.667	71	47.333	03	2.000
Biology	98	65.333	34	22.667	18	12.000
Total	250	55.500	153	33.966	47	10.434

(19) The curriculum of classes XI and XII provide the students with sufficient knowledge and understanding required at senior secondary school level

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	103	68.667	32	21.333	15	10.000
Chemistry	113	75.333	14	9.333	23	15.333
Biology	112	74.667	34	22.667	04	2.667
Total	328	72.816	80	17.76	42	09.324

(20) It develops in students economic efficiency and capacity to earn livelihood

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	78	52.000	45	30.000	27	18.000
Chemistry	95	63.333	34	22.667	21	14.000
Biology	51	34.000	65	43.333	34	22.667
Total	224	49.728	144	31.968	82	18.204

(21) It develops curiosity and power of reasoning and observation in students

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	134	89.333	04	2.667	12	08.000
Chemistry	141	94.000	03	2.000	06	04.000
Biology	128	85.333	09	6.000	13	08.667
Total	403	89.466	16	03.552	31	06.882

(22) It provides the scientific outlook (free from prejudices and based on tolerance)

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	116	77.333	04	2.667	30	20.000
Chemistry	139	92.667	03	2.000	08	05.333
Biology	134	89.333	03	2.000	13	8.667
Total	389	86.358	10	2.220	51	11.322

(23) It trains pupils for efficient application of the knowledge of principles and theories of science

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	119	79.333	07	04.667	24	16.000
Chemistry	143	92.667	02	02.000	05	5.333
Biology	129	86.000	03	02.000	18	12.000
Total	391	86.802	12	02.664	47	10.434

(24) It has utility in the practical life of students

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	29	19.333	101	67.333	20	13.333
Chemistry	94	62.667	37	24.667	19	12.667
Biology	78	52.000	63	42.000	09	6.000
Total	201	44.622	201	44.622	48	10.656

(25) Course content ofnew syllabus when compared with the old syllabus is

Teachers response towards	More		Less		The same	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	87	58.000	12	08.000	51	34.000
Chemistry	110	73.333	25	16.667	15	10.000
Biology	85	56.667	04	02.667	61	40.667
Total	282	62.604	41	09.102	127	28.194

(26) Semesterization of course for class XI and XII is

Teachers response towards	Beneficial		Not very beneficial		Semester pattern	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	74	49.333	42	28.000	34	22.667
Chemistry	78	52.000	38	25.333	34	22.667
Biology	96	64.000	13	8.667	41	27.333
Total	248	55.056	93	20.646	109	24.198

(27) It is based on the psychological principles of learning

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	107	71.333	15	10.000	28	18.667
Chemistry	117	78.000	09	6.000	24	16.000
Biology	132	88.00	10	6.667	08	5.333
Total	356	79.032	34	07.548	60	13.32

(28) It is feasible to perform all experiments in your school laboratory

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Physics	52	34.667	85	56.667	13	8.667
Chemistry	98	65.333	19	12.667	33	22.000
Biology	101	67.333	34	22.667	15	10.000
Total	251	55.722	138	30.636	61	13.542

5.1.7 Given below are the responses of class XI students towards the statements given in Questionnaire (F) about the Social Science (History, Geography, Political Science, Economics) Curriculum.

TABLE 5.7

(1) The curriculum is

Students response towards	Easy		Difficult		Apt	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	42	7.000	289	48.167	269	44.883
Geography	171	28.500	194	32.333	235	39.167
Political Science	57	9.500	309	51.500	234	39.000
Economics	15	2.500	321	53.500	264	44.000
Total	285	11.875	1113	46.375	1002	41.75

(2) Subject matter in the textbooks is

Students response towards	Interesting		Not very interesting		Boring	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	275	45.833	238	39.667	87	14.500
Geography	305	50.833	212	35.333	83	13.833
Political Science	299	49.833	258	43.000	43	7.167
Economics	451	75.167	87	14.500	62	10.333
Total	1330	55.416	795	33.125	275	11.458

(3) Your textbooks are

Students response towards	Lengthy		Short		Appropriate	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	316	52.667	53	8.833	231	38.500
Geography	392	65.333	45	7.500	163	27.167
Political Science	301	50.167	15	2.500	284	47.333
Economics	463	77.167	07	1.167	130	21.667
Total	1472	61.333	120	05.000	808	33.666

(4) The curriculum is

Students response towards	Wide & comprehensive		Narrow and limited		Heavy and burdensome	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	273	45.500	78	13.000	249	41.500
Geography	298	49.667	13	2.167	289	48.167
Political Science	389	64.833	13	2.167	198	33.000
Economics	280	46.667	50	8.333	270	45.00
Total	1240	51.666	154	06.416	1006	41.916

(5) The new curriculum is

Students response towards	Flexible		Rigid		Dynamic	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	123	20.500	243	40.500	234	39.000
Geography	241	40.167	125	20.833	234	39.000
Political Science	365	60.833	142	23.667	93	15.500
Economics	269	44.833	284	47.333	47	7.833
Total	998	41.583	794	33.083	608	25.333

(6) Your textbooks are

Students response towards	Cheap		Affordable		Costly	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	165	27.500	351	58.500	84	14.000
Geography	54	9.000	340	56.667	206	34.333
Political Science	97	16.167	350	58.333	153	25.500
Economics	73	12.167	362	60.333	165	27.500
Total	389	16.208	1403	58.458	608	25.333

(7) Semesterization of course for class XI and XII students is

Students response towards	Beneficial		Not very beneficial		Semester pattern and annual pattern are equally good	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	244	40.667	149	24.833	207	34.500
Geography	233	38.833	143	23.833	224	37.333
Political Science	297	49.500	65	10.833	238	39.667
Economics	275	45.833	91	15.167	234	39.000
Total	1049	43.708	448	18.666	903	37.625

(8) Course for class X and XII is

Students response towards	Much correlated		Less correlated		Not correlated	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	89	14.833	305	50.833	206	34.333
Geography	293	48.833	201	33.500	106	17.667
Political Science	235	39.167	207	34.500	158	26.333
Economics	93	15.500	440	73.333	67	11.167
Total	710	29.583	1153	48.041	537	22.375

(9) The curriculum is mutually correlated with different disciplines of Social Sciences.

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	223	37.167	298	49.667	79	13.167
Geography	208	34.667	252	42.000	140	23.333
Political Science	254	42.333	264	44.000	82	13.667
Economics	276	46.000	211	35.167	113	18.833
Total	961	40.041	1025	42.708	414	17.25

(10) Do you use computers for studying Social Studies

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	27	4.500	525	87.500	48	8.000
Geography	18	3.000	425	70.833	157	26.167
Political Science	223	37.167	343	57.167	34	5.667
Economics	273	45.500	312	52.000	15	2.500
Total	541	22.541	1605	66.875	254	10.583

(11) Textbooks provide you with sufficient material on the subject

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	217	36.167	280	46.667	103	17.167
Geography	358	59.667	148	24.667	94	15.667
Political Science	428	71.333	145	24.167	27	4.500
Economics	315	52.500	257	42.833	28	4.667
Total	1318	54.916	830	34.583	252	10.500

(12) Curriculum is complete in itself

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	265	44.167	241	40.167	94	15.667
Geography	264	44.000	263	43.833	73	12.167
Political Science	379	63.167	186	31.000	35	5.833
Economics	331	55.167	204	34.000	65	10.833
Total	1239	51.625	894	37.25	267	11.125

(13) All the areas of the subject are given equal importance in the new curriculum

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	308	51.333	225	37.500	67	11.167
Geography	253	42.167	201	33.500	146	24.333
Political Science	268	44.667	213	35.500	119	19.833
Economics	332	55.333	190	31.667	78	13.000
Total	1161	48.375	829	34.541	410	17.083

(14) Time frame of the school / college is sufficient enough to cover the course content

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	377	62.833	205	34.167	18	3.000
Geography	371	61.833	226	37.667	03	0.500
Political Science	407	67.833	180	30.000	13	2.167
Economics	387	64.500	179	29.833	34	5.667
Total	1542	64.25	790	32.916	68	2.833

(15) Textbooks are written in lucid, simple and precise language

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	268	44.667	211	35.167	121	20.167
Geography	348	58.000	226	37.667	26	4.333
Political Science	304	50.667	258	43.000	38	6.333
Economics	413	68.833	169	28.167	18	3.000
Total	1333	55.541	864	36.000	203	08.458

(16) The textbooks contain necessary examples, figures, graphs, maps etc.

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	182	30.333	213	35.500	205	34.167
Geography	210	35.000	200	33.333	190	31.667
Political Science	148	24.667	383	63.833	69	11.500
Economics	180	30.000	401	66.833	19	3.167
Total	720	30.000	1197	49.875	483	20.125

(17) The curriculum in History develops an insight into human relationships, social values, foster national feelings and promote international understanding

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	213	35.500	254	42.333	133	22.166

(18) The History curriculum develops critical appreciation of the past so that pupils personality is free from prejudices, parochialism and communalism

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	242	40.333	255	42.500	103	17.166

(19) It intends to promote values and ideals of humanism, secularism, socialism and democracy

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	206	34.333	193	32.166	201	33.500

(20) The History curriculum is related to community living

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	182	30.333	213	35.500	205	34.166

(21) Geography curriculum is linked with life skills.

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Geography	210	35.000	200	33.333	190	31.666

(22) Geography curriculum is experience based? (i.e. does it contain a series of activities and skills)

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Geography	381	63.500	182	30.333	37	06.166

(23) The curriculum in Geography increases curiosity, power of reasoning and observation

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Geography	568	94.666	13	02.166	19	03.166

(24) The curriculum in Political Science integrates theory and applied politics as far as possible

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Political Science	284	47.333	259	43.166	57	09.500

(25) The Political Science curriculum develops insight into political values as forces in human behaviour and human relationships

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Political Science	344	57.333	213	35.500	43	07.166

(26) The curriculum of Political Science promotes "values and ideals of humanism, secularism, socialism and democracy"

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Political Science	408	68.000	179	29.833	13	02.166

(27) The Political Science curriculum is related to community living

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Political Science	148	24.666	383	63.833	69	11.500

(28) The curriculum in Economics integrates theory and applied politics as far as possible

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Economics	264	44.000	135	22.500	201	33.500

(29) Curriculum in Economics links education with life skills

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Economics	180	30.000	401	66.833	19	03.166

(30) The Economics curriculum develops economic efficiency and capacity to earn livelihood

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Economics	268	44.666	230	38.333	102	17.000

(31) The curriculum in Economics helps you to gain insight into spiritual, economic and political values

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Economics	364	60.666	195	32.500	41	06.833

Item Nos. 17, 18, 19 and 20 are related to History textbooks.

Item Nos. 21, 22 and 23 are related to Geography textbooks.

Item Nos. 24, 25, 26 & 27 are related to Political Science textbooks.

Item Nos. 28, 29, 30 and 31 are related to Economics textbooks of class XI.

5.1.8 Given below are the responses of class XII students towards the statements given in Questionnaire (F) about the Social Science (History, Geography, Political Science, Economics) Curriculum.

TABLE 5.8

(1) The curriculum is

Students response towards	Easy		Difficult		Apt	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	56	9.333	164	27.333	380	63.333
Geography	143	23.833	128	21.333	329	54.833
Political Science	76	12.667	241	40.167	283	47.167
Economics	43	7.167	212	35.333	345	57.500
Total	318	13.25	745	31.041	1337	55.708

(2) Subject matter in the textbooks is

Students response towards	Interesting		Not very interesting		Boring	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	252	42.000	287	47.833	61	10.167
Geography	379	63.167	148	24.667	73	12.167
Political Science	400	66.667	182	30.333	18	3.000
Economics	473	78.833	76	12.666	51	08.500
Total	1504	62.666	683	28.458	203	8.458

(3) Your textbooks are

Students response towards	Lengthy		Short		Appropriate	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	252	42.000	287	47.833	61	10.167
Geography	379	63.167	148	24.667	73	12.167
Political Science	400	66.667	182	30.333	18	3.000
Economics	278	46.333	18	3.000	304	50.667
Total	1309	54.541	635	26.458	456	19.000

(4) The curriculum is

Students response towards	Wide & comprehensive		Narrow and limited		Heavy and burdensome	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	283	47.167	17	2.833	300	50.000
Geography	396	66.000	18	3.000	186	31.000
Political Science	462	77.000	25	4.167	113	18.833
Economics	432	72.000	27	4.500	141	23.500
Total	1573	65.541	87	3.625	740	30.833

(5) The new curriculum is

Students response towards	Flexible		Rigid		Dynamic	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Geography	240	40.000	232	38.667	128	21.333
History	220	36.667	184	30.667	196	32.667
Political Science	360	60.000	113	18.333	127	21.167
Economics	304	50.667	104	17.333	192	32.000
Total	1124	46.833	633	26.375	643	26.791

(6) Your textbooks are

Students response towards	Cheap		Affordable		Costly	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	101	16.833	319	53.167	180	30.000
Geography	41	6.833	341	56.833	218	36.333
Political Science	76	12.667	353	58.833	171	28.500
Economics	82	13.667	390	65.000	128	21.333
Total	300	12.500	1403	58.458	697	29.041

(7) Semesterization of course for class XI and XII students is

Students response towards	Beneficial		Not very beneficial		Semester pattern and annual pattern are equally good	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	261	43.500	141	23.500	198	33.000
Geography	300	50.000	123	20.500	177	29.500
Political Science	405	67.500	71	11.833	124	20.667
Economics	326	54.333	76	12.667	198	33.000
Total	1292	53.833	411	17.125	697	29.041

(8) Course for class XI and XII is

Students response towards	Much correlated		Less correlated		Not correlated	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	190	31.667	340	56.667	70	11.667
Geography	271	45.167	312	52.000	17	2.833
Political Science	248	41.333	280	46.667	72	12.000
Economics	165	27.500	382	63.667	53	8.833
Total	874	36.416	1314	54.75	212	8.833

(9) The curriculum is mutually correlated with different disciplines of Social Sciences.

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	268	44.667	250	41.667	82	13.667
Geography	320	53.333	201	33.500	79	13.167
Political Science	194	32.333	213	35.500	193	32.167
Economics	236	39.333	280	46.667	84	14.000
Total	1018	42.416	944	39.333	438	18.250

(10) Do you use computers for studying Social Studies

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	35	5.833	494	82.333	71	11.833
Geography	58	9.667	491	81.833	51	8.500
Pol. Science	31	5.167	491	81.333	78	13.000
Economics	53	8.833	498	83.000	49	8.167
Total	177	7.375	1974	82.25	249	10.375

(11) Textbooks provide you with sufficient material on the subject

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	315	52.500	191	31.833	94	15.667
Geography	278	46.333	229	38.167	93	15.500
Pol. Science	443	73.833	122	20.333	35	5.833
Economics	408	68.000	171	28.500	21	3.500
Total	1444	60.166	713	29.708	243	10.125

(12) Curriculum is complete in itself

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	250	41.667	230	38.333	120	20.000
Geography	345	57.500	123	20.500	132	22.000
Pol. Science	545	90.833	38	6.333	17	2.833
Economics	376	62.667	196	32.667	28	4.667
Total	1516	63.166	587	24.458	297	12.375

(13) All the areas of the subject are given equal importance in the new curriculum

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	334	55.667	178	29.667	88	14.667
Geography	272	45.333	264	44.000	64	10.667
Pol. Science	259	43.167	243	40.500	98	16.333
Economics	306	51.000	120	20.000	174	29.000
Total	1171	48.791	805	33.541	424	17.666

(14) Time frame of the school / college is sufficient enough to cover the course content

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	489	81.500	98	16.333	13	2.167
Geography	489	81.500	93	15.500	18	3.000
Pol. Science	545	90.833	37	6.167	18	3.000
Economics	529	88.167	43	7.167	28	4.667
Total	2052	85.500	271	11.291	77	03.208

(15) Textbooks are written in lucid, simple and precise language

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	316	52.667	246	41.000	38	6.333
Geography	381	63.500	184	30.667	35	5.833
Pol. Science	518	86.333	55	9.167	27	4.500
Economics	469	78.167	98	16.333	33	5.500
Total	1684	70.166	583	24.291	133	5.541

(16) The textbooks contain necessary examples, figures, graphs, maps etc.

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	208	34.667	347	57.833	45	7.500
Geography	248	41.333	276	46.000	76	12.667
Pol. Science	126	21.000	399	66.500	75	12.500
Economics	248	41.333	329	54.833	23	3.833
Total	830	34.583	1351	56.291	219	9.125

(17) The curriculum in History develops an insight into human relationships, social values, foster national feelings and promote international understanding

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	340	56.666	195	32.500	65	10.833

(18) The History curriculum develops critical appreciation of the past so that pupils personality is free from prejudices, parochialism and communalism

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	192	32.000	253	42.166	155	25.833

(19) It intends to promote values and ideals of humanism, secularism, socialism and democracy

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	241	40.166	246	41.000	113	18.833

(20) The History curriculum is related to community living

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	208	34.666	347	57.833	45	07.500

(21) Geography curriculum is linked with life skills.

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Geography	248	41.333	276	46.000	76	12.666

(22) Is Geography curriculum experience based? (i.e. does it contain a series of activities and skills)

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Geography	342	57.000	211	35.166	47	07.833

(23) The curriculum in Geography increases curiosity, power of reasoning and observation

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Geography	486	81.000	83	13.833	31	05.166

(24) The curriculum in Political Science integrates theory and applied politics as far as possible

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Pol. Science	407	67.833	132	22.000	61	10.166

(25) The Political Science curriculum develops insight into political values as forces in human behaviour and human relationships

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Pol. Science	475	79.166	97	16.166	28	04.666

(26) The curriculum of Political Science promotes "values and ideals of humanism, secularism, socialism and democracy"

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Pol. Science	481	80.166	27	04.500	92	15.333

(27) The Political Science curriculum is related to community living

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Pol. Science	126	21.000	399	66.500	75	12.500

(28) The curriculum in Economics integrates theory and applied politics as far as possible

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Economics	458	76.333	65	10.833	77	12.833

(29) Curriculum in Economics links education with life skills

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Economics	248	41.333	329	54.833	23	03.833

(30) The Economics curriculum develops economic efficiency and capacity to earn livelihood

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Economics	193	32.166	394	65.666	13	02.166

(31) The curriculum in Economics help you to gain insight into spiritual, economic and political values

Students response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Economics	400	66.666	174	29.000	26	04.333

Item nos. 17, 18, 19 and 20 are related to History textbooks.

Item Nos. 21, 22 and 23 are related to Geography textbooks.

Item Nos. 24, 25, 26 & 27 are related to Political Science textbooks.

Item Nos. 28, 29, 30 and 31 are related to Economics textbooks of class XII.

5.1.9 Given below are the responses of Social Science (History, Geography, Political Science and Economics) teachers of class XI-XII towards the statements given in Questionnaire (G) about their respective curriculum.

TABLE 5.9

(1) The curriculum is

Teachers response towards	Easy		Difficult		Apt	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	37	24.667	17	11.333	96	64.000
Geography	43	28.667	20	13.333	87	58.000
Political Science	17	11.333	48	32.000	85	56.667
Economics	12	08.000	64	42.667	74	49.333
Total	109	18.166	149	24.833	342	57.000

(2) Subject matter in the textbooks is

Teachers response towards	Interesting		Not very interesting		Boring	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	118	78.667	21	14.000	11	7.333
Geography	128	85.333	15	10.000	07	4.667
Political Science	103	68.667	40	26.667	07	4.667
Economics	103	68.667	44	29.333	03	2.000
Total	452	75.333	120	20.000	28	4.666

(3) New course when compared with the old course is:

Teachers response towards	Entirely different		Not much different		Not at all different	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	63	42.000	79	52.667	08	5.333
Geography	41	27.333	101	67.333	08	5.333
Political Science	39	26.000	106	70.667	05	3.333
Economics	39	26.000	105	70.000	06	4.000
Total	182	30.333	391	65.166	27	4.500

(4) Your textbooks are:

Teachers response towards	Lengthy		Short		Appropriate	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	69	46.000	03	2.000	78	52.000
Geography	72	48.000	04	2.667	74	49.333
Political Science	75	50.000	04	2.667	71	47.333
Economics	41	27.333	02	1.333	107	71.333
Total	257	42.833	13	2.166	330	55.000

(5) The new curriculum is

Teachers response towards	Wide & comprehensive		Narrow & limited		Heavy & burdensome	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
Geography	103	68.667	05	3.333	42	28.000
History	112	74.667	03	2.000	35	23.333
Political Science	126	84.000	03	2.000	21	14.000
Economics	103	68.667	07	4.667	40	26.667
Total	444	74.000	18	03.000	138	23.000

(6) The new curriculum is

Teachers response towards	Flexible		Rigid		Dynamic	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	103	68.667	38	25.333	09	6.000
Geography	115	76.667	15	10.000	20	13.333
Political Science	107	71.333	34	22.667	09	6.000
Economics	121	80.667	15	10.000	14	9.333
Total	446	74.333	102	17.000	52	08.666

(7) New course when compared with old course is:

Teachers response towards	More difficult		Less difficult		Of the same difficulty level	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	20	13.333	84	56.000	46	30.667
Geography	81	54.000	06	4.000	63	42.000
Political Science	91	60.667	25	16.667	34	22.667
Economics	71	47.333	48	32.000	31	20.667
Total	263	43.833	163	27.166	174	29.000

(8) The curriculum is integrated with Information Technology

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	05	3.333	117	78.000	28	18.667
Geography	19	12.667	100	66.667	31	20.667
Political Science	07	4.667	108	72.000	35	23.333
Economics	08	5.333	128	85.333	14	9.333
Total	39	06.500	453	75.500	108	18.000

(9) The curriculum is mutually correlated with different disciplines of Social Sciences.

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	61	40.667	78	52.000	11	7.333
Geography	84	56.000	63	42.000	03	2.000
Political Science	75	50.000	63	42.000	12	8.000
Economics	74	49.333	55	36.666	21	14.000
Total	294	49.000	2.59	43.166	47	07.833

(10) Textbooks provide you with sufficient material on the subject.

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	65	43.333	73	48.667	12	8.000
Geography	103	68.667	38	25.333	09	6.000
Political Science	84	56.000	55	36.667	11	7.333
Economics	85	56.667	32	21.333	33	22.000
Total	337	56.166	198	33.000	65	10.833

(11) Time frame of the school/college is sufficient enough to cover the course content.

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	71	47.333	63	42.000	16	10.667
Geography	65	43.333	64	42.667	21	14.000
Political Science	76	50.667	68	45.333	06	4.000
Economics	64	42.667	70	46.667	16	10.667
Total	276	46.000	265	44.166	59	09.833

(12) The new curriculum is better than the previous curriculum in providing social competence in students.

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	74	49.333	39	26.000	37	24.667
Geography	40	26.667	78	52.000	32	21.333
Political Science	64	42.667	72	48.000	14	9.333
Economics	73	48.667	61	40.667	16	10.667
Total	251	41.833	250	41.666	99	16.500

(13) It is related to community living.

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	94	62.667	43	28.667	13	8.667
Geography	77	51.333	55	36.667	18	12.000
Political Science	69	46.000	71	47.333	10	6.667
Economics	87	58.000	39	26.000	24	16.000
Total	327	54.5	208	34.666	65	10.833

(14) The curriculum is sufficient enough to develop the necessary aptitude and skills required at senior secondary school level.

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	68	45.333	65	43.333	17	11.333
Geography	114	76.000	17	11.333	19	12.667
Political Science	113	75.333	28	18.667	09	6.000
Economics	118	78.667	11	7.333	21	14.000
Total	413	68.833	121	20.166	66	11.000

(15) Curriculum is complete in itself.

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	73	48.667	69	46.000	08	5.333
Geography	124	82.667	11	7.333	15	10.000
Political Science	107	71.333	14	9.333	29	19.333
Economics	124	82.667	17	11.333	09	6.000
Total	428	71.333	111	18.500	61	10.166

(16) Textbooks are written in lucid, simple and precise language.

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	89	59.333	45	30.000	16	10.667
Geography	110	73.333	32	21.333	08	5.333
Political Science	74	49.333	69	46.000	07	4.667
Economics	76	50.667	64	42.667	10	6.667
Total	349	58.166	210	35.000	41	06.833

(17) The textbooks contain necessary examples, figures, graphs, maps etc.

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	95	63.333	34	22.667	21	14.000
Geography	84	56.000	51	34.000	15	10.000
Political Science	85	56.667	51	34.000	14	9.333
Economics	87	58.000	52	34.667	11	7.333
Total	351	58.500	188	31.333	61	10.166

(18) New curriculum is sensitive to changing needs and values of the society.

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	61	40.667	78	52.000	11	7.333
Geography	75	50.000	64	42.667	11	7.333
Political Science	94	62.667	31	20.667	25	16.667
Economics	113	75.333	19	12.667	18	12.000
Total	343	57.166	192	32.000	65	10.833

(19) The curriculum provides students with sufficient knowledge and skills required at senior secondary school level.

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	64	42.667	81	54.000	05	3.333
Geography	117	78.000	23	15.333	10	6.667
Political Science	116	77.333	26	17.333	08	5.333
Economics	121	80.667	20	13.333	09	6.000
Total	418	69.666	150	25.000	32	05.333

(20) It acquaints the students with attitudes and values which are necessary for healthy civic and political life.

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	65	43.333	71	47.333	14	9.333
Geography	115	76.667	14	9.333	21	14.000
Pol. Science	117	78.000	11	7.333	22	14.667
Economics	114	76.000	03	2.000	33	22.000
Total	411	68.500	99	16.500	90	15.000

(21) The new curriculum provides functional relationships among different Social Sciences.

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	69	46.000	73	48.667	08	5.333
Geography	89	59.333	35	23.333	26	17.333
Political Science	85	56.667	43	28.667	22	14.667
Economics	69	46.000	46	30.667	35	23.333
Total	312	52.000	197	32.833	91	15.166

(22) The content of the subject will enable the pupils to rise above the narrow parochial, chauvinistic and obscurantist tendencies.

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	33	22.000	81	54.000	36	24.000
Geography	118	78.667	12	8.000	20	13.333
Political Science	118	78.667	01	0.667	31	20.667
Economics	134	89.333	02	1.333	14	9.333
Total	403	67.166	96	16.000	101	16.833

(23) It develops an insight into various democratic processes.

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	69	46.000	65	43.333	16	10.667
Geography	84	56.000	47	31.333	19	12.667
Political Science	107	71.333	38	25.333	05	3.333
Economics	72	48.000	65	43.333	13	8.667
Total	332	55.333	215	35.833	53	8.833

(24) All the areas of the subject are given equal importance in the new curriculum.

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	48	32.000	84	56.000	18	12.000

(25) The History curriculum develops critical appreciation of the past so that pupils personality is free from prejudices, parochialism and communalism.

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	72	48.000	68	45.333	10	6.667

(26) Course content of new syllabus when compared with the old syllabus is

Teachers response towards	More		Less		The same	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	103	68.667	01	0.667	46	30.667
Geography	99	66.000	03	2.000	48	32.000
Political Science	98	65.333	21	14.000	31	20.667
Economics	82	54.667	13	8.667	55	36.667
Total	382	63.666	38	06.333	180	30.000

(27) Semesterization of course for class XI and XII students is

Teachers response towards	Beneficial		Not very beneficial		Semester pattern and annual pattern are equally good	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	34	22.667	103	68.667	13	8.667
Geography	31	20.667	108	72.000	11	7.333
Political Science	65	43.333	78	52.000	07	4.667
Economics	69	46.000	72	48.000	09	6.000
Total	199	33.166	361	60.166	40	06.666

(28) The new framework has reduced curriculum load.

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	113	75.333	22	14.667	15	10.000
Geography	18	12.000	118	78.667	14	9.333
Political Science	30	20.000	103	68.667	17	11.333
Economics	79	52.667	65	43.333	06	4.000
Total	240	40.000	308	51.333	52	08.666

(29) The curriculum is experience based (i.e. it contains a series of activities and skills)

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	94	62.667	51	34.000	05	3.333
Geography	135	90.000	05	3.333	10	6.667
Political Science	94	62.667	41	27.333	15	10.000
Economics	84	56.000	43	28.667	23	15.333
Total	407	67.833	140	23.333	53	08.833

(30) It helps develop in students national awareness and international understanding.

Teachers response towards	Yes		No		Can't say	
	Frequency of response	%age of response	Frequency of response	%age of response	Frequency of response	%age of response
History	71	47.333	69	46.000	10	6.667
Geography	117	78.000	16	10.667	17	11.333
Political Science	106	70.667	26	17.333	18	12.000
Economics	131	87.333	05	3.333	14	9.333
Total	425	70.833	116	19.333	59	09.833

5.2.0 Interpretation of data of class IX students as in Table 5.1:

About Statement No. 1: The students of class IX have rated **Science** textbook as follows:

14.33% have rated it easy

14.67% have rated it difficult and most of the students i.e. 71% of students have rated it apt.

It means most of the students felt that their Science textbook was according to their mental level and was understandable.

The rating of **Social Studies** textbook.

Out of a total of 600 students.

N = 98 i.e. 16.33% have rated it easy

N = 154 i.e. 25.67% have rated it difficult and

N = 348 i.e. 58% have rated it as Apt.

About Statement No. 2: The subject matter in the **Science** textbook according to pupils is

52.33% of students have found it interesting

28.66% have found it not very interesting and

19% have found it boring.

The **social studies** textbook according to pupils is

36.66% have found it interesting.

56.66% have found it not very interesting

06.66% have found it boring.

Inference: Majority of class IX students have found Science textbook interesting but majority of them have found social studies textbook not very interesting.

About Statement No. 3: The syllabus of **Science** textbook according to students is

65.66% have found it lengthy

11.66% have found it short and

22.66% have found it Appropriate

Regarding **social studies** textbook their response is,

71.33% have found it lengthy

03.50% have found it short and

25.16% have found it Appropriate

Inference: Majority of class IX students have found the syllabi of both Science and Social studies textbook lengthy.

About Statement No. 4: The curriculum of **Science** textbook, according to them is,

36.33% have found it wide and comprehensive

04.66% have found it Narrow and limited

59.00% have found it heavy and burdensome

Regarding **Social studies** textbook

25.83% have found it wide and comprehensive

04.167% have found it narrow and limited and

70.00% have found it heavy and burdensome

Inference: Majority of the students have rated the syllabi of both the Science and Social studies textbooks as heavy and burdensome.

About Statement No. 5: Response for **Science** curriculum is

63.6% have rated it Flexible

31.00% have rated it Rigid and

32.00% have rated it Dynamic

Response for **Social studies** curriculum is as follows:

23.33% have rated it Flexible

39.33% have rated it Rigid and

37.33% have rated it Dynamic

Inference: Majority of students have found Science curriculum Flexible, but they had divided opinion about social studies curriculum.

About Statement No. 6:

37% of students felt that there should not be different books for Physics, Chemistry and Biology subjects

32% felt that studying Physics, Chemistry and Biology as separate books is more beneficial and

31% felt that both the ways of studying are equally beneficial.

Whereas regarding History, Geography, Political Science and Economics,

37% felt that they should be combined in a single book

41% said that there should be separate books for each of them.

21.66% of them felt that both ways of studying is equally beneficial.

Inference: Majority of students wanted a single textbook of Science and Technology instead of having different books of Physics, Chemistry and Biology. But most of the students wanted different books of History, Geography, Political Science and Economics.

About Statement No. 7:

75% felt that Science course is integrated with IT

17.5% felt that Science course is not integrated with IT

7.5% answered can't say

25.33% felt that Social studies course is integrated with IT

66% felt that Social studies course is not integrated with IT

08.66% answered can't say

Inference: Most of the students felt that Science course is integrated with IT, whereas Social studies is not.

About Statement No. 8:

83.33% of students felt that **Science** course is correlated with other subjects.

13.33% felt that Science course is not correlated with other subjects.

03.33% of students were not sure about it and answered can't say

But regarding **Social studies** course,

39% of students felt that it is correlated with other subjects.

54.16% of students felt that it is not correlated with other subjects.

06.83% of students could not say anything.

About Statement No. 9:

76.16% of students felt that **Science** textbooks provide sufficient material on the subject.

23.33% of students said that it did not provide sufficient material on the subject.

0.5% of students answered can't say

Regarding **Social studies** textbook,

79.83% of students said it provided sufficient material on the subject.

18% of students said that it did not provide sufficient material on the subject.

02.16% of students answered can't say

About Statement No. 10:

67% of students said that the timeframe of their school was sufficient enough to cover the course content of their science textbook.

31.66% of students said that timeframe of their school was not sufficient enough to cover the course content.

01.33% of students answered can't say

About **Social studies** course content

43.5% of students felt that the timeframe of their school was sufficient enough to cover the course content.

11% felt that the timeframe of their school was not sufficient enough.

01.83% of students answered can't say.

About Statement No. 11:

85.5% of students felt that **Science** course was related to community living.

10.16% of students felt that Science course was not related to community living.

04.33% answered can't say.

Regarding **Social studies** course:

37.5% of students felt that it was related to community living.

40.5% of students felt that it was not related to community living.

22% of students answered can't say.

About Statement No. 12:

92.33% of students felt that **Science** course is complete in itself.

05.16% of students said that it is not complete in itself.

02.5% of students answered can't say.

Regarding **social studies** course

77.16% of students had opinion that it was complete in itself.

20.16% of students had opinion that it was not complete in itself and

02.66% of students answered can't say.

About Statement No. 13:

93.83% of students had opinion that the language of **science** textbook was lucid, simple and precise.

05.5% of students had opinion that the language of Science textbook is not lucid, simple and precise.

0.66% of students answered can't say.

Regarding **social studies** textbook,

59.66% of students felt that its language is lucid, simple and precise.

38.00% of students feel that its language was not lucid, simple and precise.

02.33% of students answered can't say.

About Statement No. 14:

46% of students felt that **Science** textbook had necessary examples, figures, graphs etc.

48.33% of students had opinion that Science textbook did not have necessary examples, figures, graphs etc.

05.66% answered can't say.

Regarding **Social studies** textbook,

62% students had opinion that it contained necessary examples, figures, graphs and maps etc.

36.5% of students felt that it did not have necessary examples, figures, graphs, maps etc.

01.5% of students answered can't say.

About Statement No. 15:

92.33% of students said that the **Science** experiments were feasible to be performed in their school laboratory.

About Statement No. 16:

67.66% of the students agreed that there should be two sets of curricula in **Science** i.e. Advanced and Ordinary in order to choose any one of them.

28.5% of students did not agree with the above statement.

03.83% of students answered can't say.

About Statement No. 17:

41.66% of students had opinion that **Science** course developed economic efficiency and capacity to earn livelihood.

49.83% of students did not agree with the above statement and

08.5% of students answered can't say.

About Statement No. 18:

63% of students felt that **Science** course increased curiosity and power of reasoning and observation.

34.16% of students did not feel so and

02.83% of students answered can't say.

About Statement No. 19:

92.33% of students felt that **Science** course encouraged learning by doing.

05.16% of students did not have such opinion and

02.5% of students answered can't say.

About Statement No. 20:

77.16% of students felt that **Science** course explained happening of natural phenomenon around us.

18% of students did not feel so and

04.83% of students answered can't say.

About Statement No. 21:

71.33% of students felt that **Social Studies** curriculum inculcated love for cultural values.

25.5% of students did not feel so.

03.16% of students answered can't say.

About Statement No. 22:

48.16% of students felt that Social studies curriculum developed sense of appreciation.

46.33% of students did not have such an opinion and

05.5% of students answered can't say

About Statement No. 23:

43.5% of students felt that **Social Studies** curriculum created national awareness and promoted international understanding.

49.66% of students did not feel so and

06.83% of students answered can't say.

About Statement No. 24:

52% of students agreed that **Social Studies** curriculum provided social competence.

43.33% of students did not have such an opinion and

04.66% of students answered can't say.

About Statement No. 25:

39.5% of students had an opinion that **social studies** curriculum was experience based.

57.66% of students did not have such an opinion and

02.83% of students answered can't say.

About Statement No. 26:

36.33% of students felt that **Social Studies** curriculum enabled to resolve contemporary social and individual problems.

60.5% of students did not feel so and

03.16% of students answered can't say.

5.3.0 Interpretation of Data of Class XI (PCB) students as shown in Table 5.4:

(1) 50.33% of class XI students of PCB felt that their textbooks were Apt (understandable). 29.16% of them felt that they were difficult and 20.5% of them felt that they were easy.

(2) 47.05% of class XI, PCB students felt that their Physics, Chemistry and Biology textbooks were interesting.

38.5% of them felt that they were not very interesting and 10.77% of them found the textbooks boring.

(3) 52.5% of class XI students found the textbooks lengthy, 39.66% of them found the textbooks to be appropriate and 7.83% of them found the textbooks short.

(4) 54.16% of students found the textbooks wide and comprehensive, 36.88% of them found the textbooks Heavy and Burdensome and 08.94% of them found the textbooks narrow and limited.

(5) 49% of the students found the textbooks affordable, 30.61% of them found the textbooks costly and 20.38% of them found the textbooks to be cheap.

(6) 44.22% of students felt that the semesterization of course for class XI and XII was beneficial for the students, 35.55% of them felt that it was not very beneficial and 20.22% of them felt whatever the system of examination, it doesn't make any difference on the studies.

(7) 55.16% of students found that the syllabus was integrated with Information Technology. 35% of them found that it was not integrated with Information Technology and 09.83% of them answered can't say.

(8) 46.77% of students had an opinion that Physics, Chemistry and Biology curriculum was not mutually correlated. 44.05% of them felt that it was correlated, whereas 09.16% of them answered can't say.

(9) 65.11% of students had an opinion that the textbooks provided sufficient material on the subject. 30.44% of them opined that the textbooks did not provide sufficient material on the subject, whereas 04.44% answered can't say.

(10) 52.66% of students felt that the timeframe of the school was not sufficient enough to cover the course content of the textbooks. 43.11% of them had an opinion that it was not sufficient enough and 04.22% answered can't say.

(11) 76.94% of students had an opinion that the curriculum was sufficient enough to develop scientific attitude and skills required at senior secondary school level. 21.22% of them felt that it was not sufficient enough for the same and 01.83% answered can't say.

(12) 77.55% of students felt that curriculum was complete in itself but 17.83% felt that it was not so, and 04.61% of them answered can't say

(13) 47.83% of students had an opinion that the curriculum was community based, 45.33% did not have such an opinion and 07.27% of them answered can't say.

(14) 58.77% of students felt that curriculum encouraged learning by doing. 31.77% of them differed on the opinion and 09.44% answered can't say.

(15) 74% of students opined that the language of textbook was lucid, simple and precise. 24.83% differed in their opinion and 01.16% answered can't say.

(16) 59.77% of students opined that the textbooks contained necessary examples, figures, graphs etc. but 29.72% did not have such an opinion and 10.5% answered can't say.

(17) 60.33% students opined that the prescribed curriculum increased curiosity and power of reasoning and observation but 33.61% of them did not feel so and 06.05% answered can't say.

(18) 57.38% of students had an opinion that experiments given in the textbooks were feasible to be performed in school laboratory, 38.55% of them did not think so and 04.05% of them answered can't say.

(19) 62.44% of students felt that the new course was sufficient enough to help, compete All India Medical, Engineering and other entrance examinations, but 32.16% of them did not feel so and 05.38% of them answered can't say.

5.4.0 Interpretation of data of class XII PCB students as shown in Table 5.5:

(1) 21.5% of class XII students of PCB found their textbooks easy, while 12.94% of them found the textbooks difficult and 60% of them found the textbooks apt or understandable

(2) 56.94% of students had an opinion that subject matter in Physics, Chemistry and Biology textbooks was interesting, 35% found the subject matter not very interesting, while 08.05% of them found it boring.

(3) 47.55% of class XII, PCB students found the textbooks lengthy whereas 43.55% of them found the textbooks appropriate while 08.88% students found the textbooks to be short.

(4) 58.11% of students had an opinion that curriculum in Physics, Chemistry and Biology was wide and comprehensive whereas 31.22% of them found the curriculum heavy and burdensome while 10.66% of them had an opinion that the curriculum was narrow and limited.

(5) 55.05% of students had an opinion that the textbooks were affordable, 27.16% of them found the textbooks cheap while 17.77% of them found the textbooks to be costly.

(6) 45.88% of class XII students felt that the semesterization of course for class XI and XII was beneficial for students, 28.11% of them felt it was not very beneficial for the students while 26% of them felt that whether it was semester system of examination or annual

system of examination, it did not make any difference on the studies.

(7) 30.5% of students felt that Physics, Chemistry and Biology syllabus was integrated with Information Technology, while 58.22% of them said that it was not so whereas 11.27% of them answered can't say.

(8) 46.38% of students felt that Physics, Chemistry and Biology curriculum were mutually correlated but 44% of them did not think so, whereas 9.61% of them answered can't say.

(9) 59.72% of students had an opinion that the textbooks provided sufficient material on the subject, 34.94% of them felt that they did not provide, whereas 05.33% of them answered can't say.

(10) 57.22% of students felt that the timeframe of the school is sufficient enough to cover the course content while 38.83% of them did not feel so and 03.94% of them answered can't say.

(11) 58.22% of students had an opinion that curriculum was sufficient enough to develop scientific attitude and skills required at senior secondary school level whereas 36.44% of them did not think so while 05.33% of them answered can't say.

(12) 70.22% of students felt that the curriculum was complete in itself, but 23.72% of them did not think so and 6.05% of them answered can't say.

(13) 40.27% of students had an opinion that the curriculum was community based whereas 49.61% did not think so and 10.11% answered can't say.

(14) 65.33% of students felt that curriculum encouraged learning by doing, while 27.38% of them did not think so and 07.27% of them answered can't say.

(15) 76.16% of students felt that the language of the textbook was lucid, simple and precise. 21% of them did not think so and 02.83% of them answered can't say.

(16) 49.55% of students felt that the textbooks contained necessary examples, figures, graphs etc. but 44.5% of them did not feel so and 05.94% of them answered can't say.

(17) 51.22% of students felt that the prescribed curriculum in Physics, Chemistry and Biology increased curiosity and power of reasoning and observation whereas 40.05% of them answered can't say.

(18) 60.77% of students felt that the experiments given in the textbooks were feasible to be performed in the school laboratory while 35.61% of them did not feel so and 03.61% answered can't say.

(19) 61.83% of students felt that the new course was sufficient enough to compete All India Engineering, Medical and other entrance examinations, while 35.16% of them did not think so and 03.00% of them had no comments and answered can't say

5.5.0 Interpretation of data of class XI and XII teachers of Physics, Chemistry and Biology as shown in Table 5.6:

(1) 24.66% of teachers of class XI and XII felt that the textbooks of Physics, Chemistry and Biology were easy while 41.95% of them felt, that they were difficult and 33.3% of them said they were apt or understandable.

(2) 73.26% of them felt that the subject matter in the textbook was interesting while 23.97% of them felt that they were not very interesting and 02.66% of them felt that the textbooks were boring.

(3) 34.85% of teachers found the new course entirely different when compared with the old course, but 54.39% of them did not find much difference in it, while 10.65% of them found it to be the same as the old course.

(4) 60.16% of teachers felt that the textbooks were lengthy, 36.85% of them felt that they were appropriate and 02.88% of them felt that they were short.

(5) 66.82% of teachers felt that the curriculum in Physics, Chemistry and Biology was wide and comprehensive, 30.19% of them felt it was heavy and burdensome and 2.88% of them felt that it was narrow and limited.

(6) 83.47% of teachers found the curriculum flexible while 05.55% found it rigid and 10.87% of them found it dynamic.

(7) 61.05% of teachers found the new course more difficult than the old course, but 02.22% found it less difficult than the old course whereas 36.63% of them found it to be of the same difficulty level.

(8) 52.83% of teachers found the syllabus in Physics, Chemistry and Biology integrated with Information Technology, 38.40% of them did not think so while 08.65% of them answered can't say.

(9) 50.83% of teachers felt that Physics, Chemistry and Biology curricula were mutually correlated, 34.18% of them did not feel so while 14.87% of them answered can't say.

(10) 36.63% of teachers felt that the NCERT textbooks provide with sufficient material on the subject, 32.19% of them did not feel so while 11.1% of them answered can't say.

(11) 32.19% of teachers felt that the timeframe of the school was sufficient enough to cover the course content of the textbooks, while 52.39% of them did not think so and 15.31% answered can't say.

(12) 57.49% of teachers had an opinion that the new course was better than the old course in providing social competence in students, 26.19% felt it was not so and 16.20% answered can't say.

(13) 48.61% of teachers felt that the curriculum was related to community living, while 32.63% of them did not feel so and 18.64% of them answered can't say.

(14) 80.80% of teachers had an opinion that curriculum was sufficient enough to develop scientific attitude and skills required at senior

secondary school level, 11.32% of them did not think so while 07.77% of them answered can't say.

(15) 83.47% of teachers had an opinion that curriculum was complete in itself, 06.88% did not think so and 09.54% answered can't say.

(16) 56.16% of teachers had an opinion that the language of textbook was lucid, simple and precise but 36.63% did not have such an opinion and 07.10% of them answered can't say.

(17) 56.61% of teachers had an opinion that the textbooks contained necessary examples, figures, graphs etc. but 26.19% of them did not agree with it and 17.09% of them answered can't say.

(18) 55.5% of teachers had an opinion that the curriculum developed in pupils the desired skills for solving problems in their day-to-day life, but 33.96% of them did not think so and 10.43% of them answered can't say.

(19) 72.81% of teachers had an opinion that the curriculum provided the students with knowledge and understanding required at senior secondary school level, but 17.76% of them did not think so and 09.32% of them answered can't say.

(20) 34% of teachers had an opinion that the curriculum developed in students economic efficiency and capacity to earn livelihood, but 43.33% of them did not think so and 22.66% of them answered can't say.

(21) 89.46% of teachers had an opinion that the curriculum developed in students curiosity and power of reasoning and observation but 03.55% of them opposed the view and 06.88% answered can't say.

(22) 86.35% of teachers had an opinion that the curriculum provided scientific outlook, 02.22% opposed the view and 11.32% of them answered can't say.

(23) 86.80% of teachers had an opinion that the curriculum trained pupils for efficient application of the knowledge of principles and theories of science, while 02.66% of them opposed the view and 10.43% of them answered can't say.

(24) 44.62% of teachers felt that the curriculum had utility in the practical life of students, while 44.62% of them opposed the statement and 10.65% of them answered can't say.

(25) 62.60% of teachers felt that the course content of the new syllabus was more than the old syllabus, 09.10% said it was less than the old syllabus while 28.19% answered can't say.

(26) 55.05% of teachers felt that the semesterization of course for class XI and XII was beneficial for the students, but 20.64% felt that it was not very beneficial and 24.19% felt that semester system of exams or annual exams both were equally good.

(27) 79.03% of teachers felt that the curriculum was based on the psychological principles of learning, 07.54% said that it was not so whereas 13.32% answered can't say.

(28) 55.72% of teachers agreed that all experiments given in the textbook could be easily performed in the school laboratory but 30.63% of them disagreed with it and 13.54% of them answered can't say.

Table 5.2: shows the response of class X students about their Science and Social studies curriculum. The results can be understood in the same way as in case of table 5.1.

Table 5.3: shows the response of teachers teaching Science and Technology to class IX and X about the Science curriculum.

Table 5.3: shows the response of teachers teaching Social studies to class IX and X. The interpretation of results can be understood in the same way as that of Table 5.1.

Table 5.4: shows the response of Physics, Chemistry and Biology students of class XI about their curriculum. Its data has been interpreted.

Table 5.5: shows the response of Physics, Chemistry and Biology students of class XII about science curriculum and its data has been interpreted.

Table 5.6: shows the response of Physics, Chemistry and Biology teachers of class XI and XII about the curriculum of their subjects and its data has been interpreted.

Table 5.7: shows the responses of Geography, History, Political Science and Economics students of class XI about their curriculum.

Table 5.8: shows the responses of Geography, History, Political Science and Economics students of class XII about their curriculum.

Table 5.9: shows the responses of Geography, History, Political Science and Economics teachers of class XI and XII about their curriculum.

5.6.0 Rating of Science Curriculum by the Lower Secondary Students and Teachers:

1. Majority of class IX students (71%) found Science textbook neither easy nor difficult but Apt. Majority of class X students (50.16%) found Science textbook understandable i.e. neither easy nor difficult.

Whereas a greater majority of teachers (44.66%) felt the textbooks to be easy for the students.

(2)a. 52.33% of class IX students felt that subject matter in the Science textbook was interesting.

b. Whereas 68.83% of class X students found subject matter in their textbook interesting.

c. 72% of teachers felt that subject matter in the textbook for the students was interesting.

(3) 65.66% of class IX students felt that syllabus in textbook was lengthy. Whereas, 54.33% of class X students felt that syllabus in Science textbook is lengthy. Also 65.33% of teachers felt science textbooks were lengthy.

(4) 59% of class IX students rated the science textbook heavy and burdensome. 54.33% of class X students rated the Science textbook to be wide and comprehensive whereas, 65.33% of teachers felt that Science textbooks were wide and comprehensive.

(5) 63.66% of class IX students found Science curriculum flexible. 47% of class X students found Science curriculum flexible. 66% of teachers found Science curriculum flexible.

(6) 37% of class IX students felt that there should be a single book of Science and Technology whereas 32% of them felt that in a single book there should be division of chapters like Physics, Chemistry and Biology, whereas 31% of them liked both the patterns. In this way there was no clear majority of students favouring any one option. But a greater majority of class X students i.e. 46.83% wanted to have clear division of subjects like Physics, Chemistry and Biology in a single textbook and also a greater majority (72%) of teachers preferred a single book with clear divisions like Physics, Chemistry and Biology in it.

(7) 75% of class IX students said that Science and Technology course was integrated with IT (Information Technology). 62.33% of class X students found the Science and Technology course integrated with IT. 56% of teachers found Science and Technology course integrated with IT.

(8) 83.33% of class IX students found Science course correlated with other subjects. 57% of class X students found Science course correlated with other subjects. 58% of teachers also found Science course correlated with other subjects.

(9) 76.16% of class IX students said that Science textbook provided sufficient material on the subject. 59% of class X students also said

the same, whereas 88% of teachers found the textbook informative and provided sufficient material on the subject.

(10) 67% of class IX students said that timeframe of the school was sufficient enough to cover the course content. 61% of class x students said that timeframe was sufficient enough to cover the course content. 62% of teachers felt that timeframe was not sufficient enough to cover the course content.

(11) 85.5% of class IX students felt the Science curriculum was related to community living. Only 47.83% of class X students felt so whereas 48.83% of them did not feel so. 75.33% of teachers said it was not related to community living.

(12) 92.33% of class IX students rated the Science textbook complete in itself. Whereas 49.66% of class X students rated it so, but 40.5% of them said it was not complete in itself. Whereas, 89.33% found it complete in itself.

(13) 93.83% of class IX students found the language of science textbook lucid, simple and precise. 67.33% of class X students also agreed the same. Whereas 42% of teachers agreed with it and 58% of them said that language is not lucid, simple and precise.

(14) 48.33% of class IX students did not agree to the opinion that science textbook contained necessary examples, figures, graphs etc., whereas 46% of them agreed to it. 46.5% of class X students agreed with the opinion and 43% of them did not agree. 42% of teachers agreed with the opinion and 58% of them did not agree with it.

(15) 92.33% of students of class IX agreed to the opinion that Physics, Chemistry and Biology experiments were feasible to be performed in the school laboratory. 66.83% of class X students also had the same opinion.

(16) 67.66% of class IX students agreed with the opinion that there should be two sets of curricula-advance and ordinary in Science & Technology to choose any one of them. 66.33% of class X students also agreed with the same opinion. Whereas 48% of teachers agreed with the opinion and 50% of them did not agree with it.

(17) 41.66% of class IX students agreed with the opinion that Science course developed economic efficiency and capacity to earn livelihood and 49.83% did not think so. 48% of class X students agreed with the above opinion and 43% of them did not agree with it. 67.33% of teachers agreed with the opinion and 24.66% of them did not agree with it.

(18) 63% of class IX students agreed with the opinion that Science curriculum increased curiosity and power of reasoning and observation. Whereas, 45.66% of class X students had the same opinion and 42.33% of them did not have such opinion. 91.33% of teachers had such an opinion.

(19)a. 92.33% of class IX students had the opinion that Science course encouraged learning by doing.

b. 28.83% of class X students had such opinion but 57.16% of them did not agree with the opinion and 14% of them remained indifferent on the matter.

c. 72% of teachers agreed with the above opinion, but 23.33% did not agree with it and 4.66% remained indifferent to it.

(20) 77.16% of class IX students agreed with the opinion that Science course explains happening of natural phenomenon around us.

42.5% of class X students agreed with the above opinion, whereas 52.8% of them did not agree with it.

(21) 95.33% of teachers agreed to the opinion that Science curriculum provided scientific outlook (free from prejudices and based on tolerance).

(22) 85.33% of teachers agreed with the opinion that the prescribed curriculum helped develop in students attitude and skills required at secondary school level.

(23) 27.33% of teachers agreed with the opinion that new course was better than the old course in providing social competence in students, whereas 34% of them did not agree with the opinion and 05.66% answered can't say.

(24) 63.33% of teachers felt that the curriculum was sensitive to changing technology and social needs. 35.33% of them did not think so and 01.33% of them answered can't say.

(25) 76% of teachers agreed with the opinion that Science curriculum helped in building up of proper development of personality in students.

(26) 34.66% of teachers agreed with the opinion that Science curriculum had utility in the practical life of students.

(27) 90.66% of teachers agreed with the opinion that Science curriculum makes proper exercise of mental discipline in children.

(28) 86% of teachers said that Science curriculum developed sense of appreciation.

(29) 95.33% of them agreed with the opinion that it was based on Psychological principles of learning.

(30) 96% of teachers agreed with the opinion that the objectives of new syllabus could be achieved under present conditions & circumstances.

5.7.0 Rating of Social Studies Curriculum by the Lower Secondary Students and Teachers:

(1) 58% of class IX students found the Social studies textbook understandable, 16% of them found it easy and 25.66% of them found it difficult.

49.50% of class X students found the textbook understandable whereas, 53.33% of teachers found it understandable for the students.

(2) 56.66% of class IX students found the textbook not very interesting

Whereas 48.167% of students of class X also found it to be not very interesting.

Whereas 70.66% of teachers found them interesting for students.

(3) 71.33% of class IX students found the social studies syllabus to be lengthy.

Whereas 67.83% of class X students found it lengthy.

64.66% of teachers also found it to be lengthy.

(4) 70% of class IX students found the social studies curriculum heavy and burdensome. 60.50% of class X students found it to be heavy and burdensome. Whereas, 65.33% of teachers found it to be wide and comprehensive.

(5) 39.33% of class IX students found social studies curriculum Rigid, whereas 23.33% of them found it Flexible and 37.33% found it to be dynamic.

33.83% of class X students found it flexible, 33.5% of them found it Rigid and 32.66% of them found it to be dynamic.

Whereas, 58.66% of teachers found it flexible.

(6) 41.33% of class IX students wanted to study History, Geography, Civics and Economics separately, as different sections in a single book.

34.16% of class X students wanted to study History, Geography, Civics & Economics separately in a single book.

Whereas 80% of teachers also felt that teaching History, Geography, Civics and Economics separately as different parts in a single book was more beneficial for students.

(7) 66% of class IX students found the social studies course integrated with Information Technology.

39% of class X students said that the course was not integrated with IT. 81.33% of teachers said social studies course was not integrated with IT (Information Technology)

(8) 54.16% of class IX students said that social studies course was correlated with other subjects. 50.16% of class X students also had the same opinion.

While, 81.33% of teachers said that the course was not correlated with other subjects.

(9) 79.83% of class IX students said that social studies textbook provided sufficient material on the subject.

54% of class X students said that the textbook did not provide sufficient material on the subject.

Whereas, 92% of teachers said, that the textbook provided sufficient material on the subject.

(10) 43.50% of class IX students and 38.33% of class X students said that the timeframe of the school was sufficient enough to cover the course content.

43% of class X students and 54.66% of class IX students said that the timeframe of the school was not sufficient enough to cover the course content.

52.66% teachers also felt that timeframe of the school was not sufficient enough to cover the course content.

(11) 40.5% of class IX students and 47.66% of class X students found that the curriculum was not related to community living.

Whereas, 60.66% of teachers found the curriculum was not related to community living.

(12) 77.16% of class IX students and 49.83% of class X students found the course complete in itself.

74% of teachers also found the course complete in itself.

(13) 59.66% of class IX students and 57.16% of class X students found the language of the textbook lucid, simple and precise.

74.66% of teachers did not find the language of textbook lucid, simple and precise.

(14) 62% of class IX students and 49.5% of class X students found that the textbook contained necessary examples, figures, graphs etc.

52% of teachers felt that the textbook did not contain necessary graphs, maps, examples etc.

(15) 71.33% of class IX students and 39.83% of class X students had an opinion that social studies curriculum inculcated love for cultural values.

(16) 48.16% of class IX students and 45.66% of class X students found that social studies curriculum developed sense of appreciation, whereas, 46% of teachers believed so.

(17) 49.66% of class IX students and 43.5% of class X students said that social studies curriculum did not develop national awareness and did not promote international understanding.

Whereas 48% of teachers felt that it developed national awareness and international understanding and 43.33% of them did not feel so and 8.66% remained indifferent on the matter.

(18) 52% of class IX students and 46.66% of class X students had an opinion that social studies curriculum provided, social competence.

(19) 57.66% of class IX students felt that social studies curriculum was not experience based but 72.5% of class X students felt that it was experience based.

48% of teachers also felt so.

(20) 60.5% of class IX students and 50.5% of class X students felt that social studies curriculum enabled to resolve contemporary social and individual problems.

(21) 39.33% of teachers felt that social studies curriculum was sensitive to changing needs and values of the society but 49.33% of them did not feel so and 11.33% of them remained indifferent on the matter.

(22) 52% of teachers felt that the curriculum enabled the students to gain insight into spiritual, economic and political values whereas 36.66% of them did not feel so and 11.33% remained indifferent on the matter.

(23) 75.33% of teachers felt that the curriculum developed insight into human relationships, social values and attitudes.

(24) 34.66% of teachers felt that the curriculum intended to promote the values and ideals of humanism, secularism, socialism and democracy but 52% of them did not have such opinion and 13.33% did not respond to the answer.

(25) 56% of teachers had an opinion that it provided functional relationships among different branches of social sciences.

(26) 52% of teachers said it helped in building intelligent democratic citizenship in students.

(27) 45.33% agreed that the course content of syllabus was more when compared with the old syllabus.

(28) 96.66% of teachers agreed that the objectives of new syllabus could be achieved under present conditions and circumstances.

5.8.0 Conclusion:

This chapter has outlined the percentage and frequency of responses of students and teachers of secondary school Science and Social Science towards the statements given in questionnaires. It also contains the Interpretation of data and the rating of Science and Social Studies Curriculum by the Secondary School teachers and students.

CHAPTER 6

FINDINGS, CONCLUSION, IMPLICATIONS AND SUGGESTIONS FOR FURTHER RESEARCH

6.0.0 Introduction:

The preceding chapter exposes the results followed by analysis and interpretations. The present chapter, as the title indicates, has been classified into three main parts, viz., findings, conclusions, and implications.

The results have been consolidated and presented under the first part, 'Findings of the Study'. The possible conclusions related to the study have been presented under the second part 'Conclusions'. Implications of the results have been drawn and presented under the third part 'Implications'. This chapter ends with a small section on 'Suggestions for Further Research', wherein, some suggestions have been given to provide direction for further research.

6.1.0 Findings:

6.1.1 Opinion of Majority of Students of Class IX & X about their NCERT Science & Technology Textbook and Science Curriculum:

1. Science and Technology textbook is according to the mental level of the students and is easily understandable to them.
2. Subject matter in the textbook is interesting.
3. The syllabus is quite lengthy.
4. The curriculum of Science is heavy and burdensome according to class IX students. But class X students found it to be wide and comprehensive.
5. It is flexible.

6. Class IX students opined that Physics, Chemistry and Biology should be included in a single textbook, whereas class X students had an opinion that there should be separate books for physics, chemistry and biology.
7. Science course is integrated with Information Technology.
8. Science course is also correlated with other subjects.
9. NCERT Science textbooks provide sufficient material on the subject.
10. The course content in the textbooks is such that it can be covered or taught within the timeframe of the school.
11. Science course is also related to community living.
12. It is complete in itself.
13. Language used in the textbooks is lucid, simple and precise.
14. Science textbooks did not have necessary examples, figures, graphs etc.
15. Science experiments were feasible to be performed in their school laboratory.
16. Majority of students wanted two sets of curricula in Science & Technology i.e. Advanced course & Ordinary course in order to be able to chose any one of them.
17. The prescribed Science course did not develop economic efficiency and capacity to earn livelihood.
18. The science course is such that it increases curiosity and power of reasoning and observation.
19. The science course encouraged learning by doing.
20. It also explained happening of natural phenomenon around them.

6.1.2 Findings of Majority of Students of class IX and X about their NCERT Social Studies textbook and Social Studies Curriculum:

1. Their social studies textbook is according to their mental level and is understandable.
2. The textbook is not very interesting.
3. It is lengthy.
4. The course is heavy and burdensome.
5. The social studies curriculum is rigid.
6. The students wanted separate books for Geography, History, Civics and Economics instead of a single book containing all these.
7. The social studies course is not integrated with Information Technology.
8. Social studies course is not correlated with other subjects.
9. The social studies textbook provided sufficient material on the subject.
10. The social studies course was such that it could be covered within the timeframe of their school.
11. The course was related to community living.
12. The social studies course was complete in itself.
13. The language of the textbook was lucid, simple and precise.
14. It contained necessary examples, figures, graphs, maps etc.
15. Social studies curriculum inculcated love for cultural values.
16. Social studies curriculum developed sense of appreciation.
17. It was such that it created national awareness and promoted international understanding.

18. It provided social competence.
19. It is not experience based.
20. Social studies curriculum was not upto the mark in resolving contemporary social and individual problems.

6.2.0 Findings of Majority of Teachers of Science teaching classes IX and X about the NCERT Science & Technology textbook and Science Curriculum:

1. Science textbook for the students is easy and understandable.
2. Subject matter in the textbook is interesting.
3. Syllabus of new course of NCERT Science when compared with the old course is not much different.
4. The syllabus for the students is lengthy.
5. The curriculum in Science and Technology is wide and comprehensive.
6. It is flexible.
7. Students wanted separate books for Physics, Chemistry and Biology instead of a single book containing all these.
8. Science & Technology course is integrated with Information Technology.
9. The course is also correlated with other subjects.
10. The textbooks provide sufficient material on the subject.
11. Science course is such that it could not be covered within the timeframe of the School.
12. New course of Science is not better than the old course in providing social competence in students.
13. The Science course is not related to community living.

14. The prescribed curriculum developed in students attitude and skills required at secondary school level.
15. Science curriculum is complete in itself.
16. The language used in Science textbook is not Lucid, neither simple nor precise.
17. The Science textbook contained necessary examples, figures, graphs etc.
18. The curriculum is sensitive to changing technology and social needs.
19. It encouraged learning by doing.
20. It is such that it can develop in students economic efficiency and capacity to earn livelihood.
21. It is such that it can increase curiosity and power of reasoning and observation among students.
22. It provides scientific outlook (free from prejudices and based on tolerance).
23. The Science curriculum is such that it helps building up of proper development of personality in students.
24. But it does not have utility in the practical life of students.
25. It makes proper exercise of mental discipline in children.
26. It develops sense of appreciation.
27. It is based on Psychological Principles of learning.
28. Teachers do not agree with the opinion that there should be two sets of curricula i.e. ordinary course and advance course for the students.

29. They also agreed that the objectives of new course can be achieved under present circumstances.

6.3.0 Findings of Majority of Teachers of Social Studies teaching classes IX and X about the NCERT Social Studies textbook and Social Studies curriculum:

1. Social Studies textbook for the students is according to their mental age and is understandable to them.
2. Subject matter in the textbook is also interesting.
3. New course of NCERT when compared with the old course is entirely different.
4. The syllabus in textbook is lengthy.
5. The curriculum of social studies is wide and comprehensive.
6. It is flexible.
7. Majority of the teachers feel that studying Geography, History, Civics and Economics as separate books is more beneficial for students.
8. Social studies course is not integrated with IT (Information Technology).
9. Social studies course is correlated with other subjects.
10. The textbook provides sufficient material on the subject.
11. The course is such that it could not be covered within the prescribed timeframe of the school.
12. New course is better than the old course in providing social competence in students.

13. But social studies course is not related to community living.
14. The prescribed curriculum helps develop in students attitude and skills required at secondary school level.
15. The curriculum is complete in itself.
16. The language of the textbook for the students is not Lucid, neither simple nor precise.
17. The textbook does not contain necessary examples, figures, graphs, maps etc.
18. Curriculum in social studies is not sensitive to changing needs and values of the society.
19. It is experience based that is, it contains a series of activities and skills.
20. Curriculum is such that it enables the students gain insight in spiritual, economic and political values.
21. It helps children develop an insight into human relationships, social values and attitudes.
22. The curriculum is such that it does not intend to promote the values and ideals of Humanism, Secularism, Socialism and Democracy.
23. It provides functional relationships among different branches of social sciences.
24. It helps in building intelligent democratic citizenship in students.
25. Course content of new syllabus when compared with the old one is approximately the same.
26. The curriculum is based on the Psychological Principles of learning.
27. It develops in students sense of appreciation.

28. It helps develop national awareness and international understanding.
29. The objectives of new course can be achieved under present conditions and circumstances.

6.4.0 Findings of the Majority of Students of class XI and XII about their NCERT Science textbooks and Science curriculum:

6.4.1 Opinion about Physics textbooks and Curriculum:

1. Class XI students had an opinion that content of Physics textbook is difficult. Whereas class XII students found the Physics textbooks apt i.e. according to their mental level.
2. Class XI students found the subject matter in the textbook not very interesting. Whereas, class XII students found it to be interesting.
3. They found the textbooks neither lengthy nor short but appropriate.
4. They found the curriculum to be wide and comprehensive.
5. Textbooks were found to be neither cheap nor costly but affordable.
6. Semesterization of course for class XI and XII is beneficial for the students.
7. Their syllabus was not integrated with Information Technology, that is no use of IT was made for the study of Physics.
8. The curricula of Physics, Chemistry and Biology are mutually correlated.
9. Physics textbooks provided them with sufficient material on the subject.

10. Class XI students felt that course content in the books is too much and it cannot be covered within the school hours. Whereas, class XII students felt that course content of Physics textbook was sufficient enough to be covered within the timeframe of the school hours.
11. They also felt that Physics curriculum is sufficient enough to develop scientific attitude and skills required at senior secondary school level.
12. Curriculum was found to be complete in itself. This is a requirement for a good curriculum.
13. According to them curriculum was community based i.e. it is related to the needs of the community and related to community life.
14. They also had an opinion that Physics curriculum encouraged learning by doing.
15. They found the language of the textbook to be lucid, simple and precise.
16. Class XI students said that the textbooks contained necessary examples, figures, graphs etc. But class XII students felt that it did not have necessary examples, figures, graphs etc.
17. Both class XI and XII students felt that the prescribed curriculum increases curiosity and power of reasoning and observation.
18. They said that the experiments given in the textbooks were feasible to be performed in their school laboratory.

19. They also said that the new course was sufficient enough to help the students compete All India Medical, Engineering and other entrance examinations.

6.4.2 Opinion about Chemistry and Biology textbooks and curriculum:

1. Both class XI & XII students found the contents of the Chemistry and Biology textbooks to be neither easy nor difficult but apt. i.e. it was according to their mental level.
2. Class XI students found the subject matter in the Chemistry textbook not very interesting, whereas the class XII students found it to be interesting. But they found Biology textbooks quite interesting.
3. Class XI students found the Chemistry textbooks lengthy, whereas class XII students found them neither lengthy nor short but appropriate. Biology textbooks of class XI & XII were found to be lengthy by them.
4. Both Chemistry and Biology curriculum was found to be wide and comprehensive.
5. Chemistry as well as Biology textbooks according to the students were neither cheap nor costly but affordable.
6. Semesterization of Chemistry and Biology course for class XI and XII was found to be beneficial for them.
7. Their syllabus of Chemistry and Biology was not integrated with Information Technology, that is no use of IT was made for the study of Chemistry and Biology.

8. The curriculum of Chemistry is correlated with that of Physics and Biology. But the curriculum of Biology is not correlated with Physics and Chemistry.
9. Chemistry textbooks provided them sufficient material on the subject. Class XI students found their Biology textbook provided sufficient material on the subject, but class XII students said that it did not provide sufficient material on the subject.
10. Course content in the Chemistry textbooks was sufficient enough to be covered within the timeframe of the school. Class XI students found that Biology course was too much and it couldn't be covered within the school hours, but class XII course was sufficient enough to be covered within the school hours.
11. Chemistry and Biology curriculum was found to be sufficient enough to develop scientific attitude and skills required at senior secondary school level.
12. Chemistry and Biology curriculum was found to be complete in itself.
13. Chemistry curriculum according to them was not community based i.e. it was not organically related to community life. Class XI students found the curriculum in Biology to be community based, but class XII students said that it was not community based i.e. it was not related to community life.
14. The Chemistry and Biology curriculum encouraged learning by doing.
15. The language of the Chemistry and Biology textbooks was found to be lucid, simple and precise.

16. Class XI students found that the Chemistry textbook contained necessary examples, figures, graphs etc. whereas, a majority of class XII students found that their book did not contain necessary examples, figures, graphs etc. But they found both Biology class XI and XII textbooks contained necessary examples, figures, graphs etc.
17. They found that the prescribed Chemistry curriculum increases curiosity and power of reasoning and observation. Whereas class XI students said that Biology syllabus did not increase curiosity and power of reasoning and observation, but class XII course increased curiosity and power of reasoning and observation.
18. They also said that the experiments given in the Chemistry and Biology textbooks were feasible to be performed in their school laboratory.
19. According to them new course in Chemistry and Biology was sufficient enough to help them compete Medical, Engineering and other entrance examinations.

6.5.0 Findings of the majority of teachers of Science (Physics, Chemistry and Biology) taking classes XI and XII about the NCERT Science textbooks and the curriculum.

1. According to them content of Physics textbook is difficult whereas the content of chemistry textbook is apt or understandable to students and that of biology textbook is easy for the students.
2. Subject matter in the Physics, Chemistry and Biology textbook is interesting.

3. The new course in Physics and Chemistry is not much different from the old course but the old course of Biology is entirely different from the new course.
4. Textbooks of Physics, Chemistry and Biology are lengthy.
5. Curriculum in Physics, Chemistry and Biology is wide and comprehensive.
6. The curriculum in Physics, Chemistry and Biology is flexible.
7. New course in Physics, Chemistry and Biology is more difficult when compared with the old one.
8. Syllabus in Physics and Biology is integrated with Information Technology i.e. use of IT is made in teaching-learning process of Physics and Biology but Chemistry syllabus is not integrated with IT.
9. Physics, Chemistry and Biology curricula are mutually correlated.
10. Physics, Chemistry and Biology textbooks provide students sufficient material on the subject.
11. Majority of Physics teachers believed that course content in Physics was sufficient to be covered within the timeframe of the school. But Chemistry and Biology teachers said that school hours were not sufficient to cover their course.
12. New course in Physics, Chemistry and Biology was better than the old course in providing social competence in students.
13. Curriculum in Physics, Chemistry and Biology is related to community living.

14. Curriculum in Physics, Chemistry and Biology is sufficient enough to develop scientific attitudes and skills required at senior secondary school level.
15. Curriculum in Physics, Chemistry and Biology is complete in itself.
16. The language of Physics, Chemistry and Biology textbooks is lucid, simple and precise.
17. The Physics textbooks do not contain necessary examples, figures, graphs etc., but Chemistry and Biology textbooks contain the same.
18. The Physics, Chemistry and Biology curriculum develop in pupils the desired skills for solving problems in their day-to-day life.
19. The curriculum in Physics, Chemistry and Biology provide the students sufficient knowledge and understanding required at senior secondary school level.
20. The curriculum develops in students economic efficiency and capacity to earn livelihood.
21. This curriculum also develops in students curiosity and power of reasoning and observation in students.
22. The Physics, Chemistry and Biology curriculum provides scientific outlook, i.e. free from prejudices and based on tolerance.
23. This curriculum also trains pupils for efficient application of the knowledge of principles and theories of science.
24. Physics curriculum does not have utility in the practical life of students, whereas Chemistry and Biology curriculum has utility in the practical life of students.

25. Course content in the new course of Physics, Chemistry and Biology is more than the old course.
26. Semesterization of Physics, Chemistry and Biology course for class XI and XII is more beneficial for the students.
27. Curriculum in Physics, Chemistry and Biology is based on the Psychological principles of learning.
28. Majority of Physics teachers said that it is not feasible to perform all experiments in the textbook in school laboratory. But Chemistry and Biology teachers said that it is possible in their school laboratory.

6.6.0 Findings of the majority of students of Social Studies (Geography, History, Political Science and Economics) studying in class XI and XII about their NCERT Social Sciences textbooks and the curriculum

6.6.1 Opinion about History and Geography textbooks and curriculum:

1. Class XI students found History curriculum difficult while class XII students found it to be apt (understandable) i.e. according to the mental level of students. While both class XI and XII students found the Geography curriculum to be apt or understandable.
2. Class XI students found the subject matter in History textbooks interesting, while class XII students said that it is not very interesting.
3. They found History and Geography textbooks lengthy.

4. Class XI students found History curriculum to be wide and comprehensive, while class XII students said that the curriculum is heavy and Burdensome. Both of them found Geography curriculum to be wide and comprehensive.
5. They found History curriculum flexible. But class XI students found Geography curriculum to be rigid and class XII students said that it is flexible.
6. Students found History and Geography textbooks affordable.
7. They also said that semesterization of History and Geography course for class XI and XII students is beneficial.
8. They said that History course for class X, XI and XII is less correlated. But Geography course of class X and XI is much correlated and that of class XI and XII is less correlated.
9. Class XI students found that History and Geography course is not correlated with different disciplines of social sciences, but class XII students said that it is correlated with different disciplines of social sciences.
10. They said, they do not make use of computers to study Geography and History.
11. Class XI students said History textbooks do not provide sufficient material on the subject, while Geography textbooks do provide. Whereas, class XII students said both History and Geography textbooks provide sufficient material on the subject.
12. Both class XI and XII students had an opinion that History and Geography curriculum is complete in itself.

13. They also found that all the areas of curriculum in History and Geography were given equal importance in the new curriculum.
14. Most of the students believed that course content in History and Geography was sufficient enough to be covered within the timeframe of the college or college hours.
15. Both History and Geography textbooks were found to be written in lucid, simple and precise language.
16. Class XI students found that the History textbooks did not contain necessary examples, figures, graphs, maps etc, but Geography textbooks did contain them. Whereas, class XII students found that both History and Geography textbooks did not contain necessary examples, figures, graphs, maps etc.
17. Class XI students believed that the curriculum in History did not develop an insight into human relationships, social values, foster national feelings and did not promote international understanding whereas class XII students said that it does develop the above qualities.
18. Class XI and XII students said that curriculum in History was not successful in developing critical appreciation of the past so that pupil's personality is free from prejudices, parochialism and communalism.
19. Class XI students believed that the curriculum in History intends to promote values and ideals of humanism, secularism, socialism and democracy, whereas class XII students said that it did not intend to promote the above ideals.

20. They said that History curriculum is not related to community living.
21. Class XI students said that Geography curriculum is linked with life skills whereas class XII students said that it was not so.
22. Both class XI and class XII students said that their Geography curriculum was experience based i.e. it contained a series of activities and skills.
23. They also believed that Geography curriculum increases curiosity, power of reasoning and observation.

6.6.2 Opinion about Political Science and Economics textbooks and curriculum:

1. Class XI students found the Political Science and Economics curriculum to be difficult, whereas class XII students found them to be apt or understandable i.e. according to the mental level of the students, whereas class
2. Class XI and XII students found the subject matter both in Political Science and Economics textbooks to be interesting.
3. Class XI students found the textbooks of both subjects to be lengthy, while class XII students found the textbooks of Political Science to be lengthy while that of Economics to be appropriate.
4. Students of both the classes said that the textbooks of these subjects were wide and comprehensive.
5. Students said that the political science curriculum was found to be flexible, but class XI students found the Economics curriculum to be rigid.

6. Students found the price of the textbooks to be affordable.
7. Semesterization of course was found to be beneficial for the students.
8. Class XI students found the course of class XI and XII of Political Science was much correlated while that of Economics was less correlated but class XII students said that the course of both the subjects in class XI and XII was less correlated.
9. The students also said that the course in these two subjects was not correlated with different disciplines of social sciences.
10. The students also said that they did not use computers for studying social studies.
11. The students said that the textbooks of these subjects provide sufficient material on the subject.
12. They also said that the curriculum is complete in itself.
13. They said that all the areas of the subject were given equal importance in the new curriculum.
14. Students said that the course content in these subjects was sufficient enough to be covered within the timeframe of the college hours.
15. The students found the language of the textbooks to be lucid, simple and precise and was quite understandable to them.
16. They also agreed that the textbooks contained necessary examples, figures, graphs, maps etc.

Item Nos. 17 to 23 in the questionnaire are not related to these subjects.

24. The students said that the curriculum in Political Science integrates theory and applied politics as far as possible.

25. Students also agreed that the curriculum in Political Science develops insight into political values as forces in human behaviour and human relationships.
26. The students agreed that the curriculum in Political Science promotes "values and ideals of humanism, secularism, socialism and democracy."
27. The students said that the Political Science curriculum is not related to community living.
28. The students said that the curriculum in Economics integrates theory and applied politics as far as possible.
29. Students said that the Economics curriculum does not link education with life skills
30. Class XI students said that the Economics curriculum develops economic efficiency and capacity to earn livelihood but class XII students did not agree to this.
31. The students of both class XI and XII said that the curriculum in Economics helped them to gain insight into spiritual, economic and political values.

6.7.0 Findings of the majority of the teachers of History, Geography, Political Science and Economics about the class XI and XII curriculum in these subjects:

1. Majority of History, Geography, Political Science and Economics teachers teaching class XI and XII found the curriculum in these subjects to be neither difficult nor apt but understandable or apt for the students.

2. According to them the subject matter in these textbooks is also interesting.
3. They said that the new course when compared with the old course was not much different.
4. History, Geography and Economics textbooks were neither lengthy nor short but appropriate according to the teachers, but political science teachers found the textbooks to be lengthy.
5. Teachers of all the subjects found their respective curriculum to be wide and comprehensive.
6. They also found the new curriculum to be flexible in nature.
7. Teachers of Geography, Political Science and Economics said that the new course was more difficult than the old course while History teachers found it to be less difficult than the old course.
8. Teachers of all these subjects said that the curriculum is not integrated with Information Technology.
9. Geography, Political Science and Economics teachers found their curriculum to be correlated with different disciplines of social sciences while History teachers said it was not so.
10. Geography, Political Science and Economics teachers said that their textbooks provided the students sufficient matter on the subject but History teachers said that History textbooks did not provide sufficient material on the subject.
11. According to History, Geography and Political Science teachers their course content was sufficient enough to be covered within the timeframe of the college hours, but the Economics teachers felt

that course was more and could not be covered properly during college hours.

12. Geography and Economics teachers felt that new curriculum was better than the previous curriculum in providing social competence in students, whereas History and Political Science students did not feel so.
13. History, Geography and Economics teachers felt that their curriculum was related to community living, whereas political science teachers did not feel so.
14. The teachers said that the curriculum in these subjects was sufficient enough to develop the necessary aptitude and skills required at senior secondary school level.
15. The teachers also said that the curriculum in these subjects was complete in itself.
16. The language used in these textbooks was also found to be lucid, simple and precise by the teachers.
17. They also said that the textbooks contained necessary examples, figures, graphs, maps etc.
18. Geography, Political Science and Economics teachers felt that the new curriculum is sensitive to changing needs and values of the society while History teachers did not agree with this viewpoint.
19. Except History teachers, the remaining teachers agreed that the curriculum provides the students sufficient knowledge and skills required at senior secondary school level.

20. Except History teachers, other teachers agreed that the curriculum helps the students to acquaint them with attitudes and values which are necessary for healthy civic and political life.
21. Except History teachers, all the others agreed that the new curriculum provides functional relationships among different social sciences.
22. Again, except History teachers the others agreed that the content of the subject will enable the pupils to rise above the narrow parochial, chauvinistic and obscurantist tendencies.
23. Teachers of all the subjects agreed that their curriculum developed an insight into various democratic processes.
24. The History teachers felt that all the areas of the subject were not given equal importance in the new curriculum.
25. The History teachers also felt that History curriculum developed critical appreciation of the past so that pupils personality is free from prejudices, parochialism and communalism.
26. The teachers also felt that the course content of the new syllabus when compared with the old syllabus is more.
27. The teachers felt that the semesterization of course is not very beneficial for the students.
28. History and Economics teachers felt that the new curriculum has reduced curriculum load while Geography and Political Science teachers felt that it was not so.
29. Teachers of all these subjects agreed that the curriculum is experience based, that is it contains a series of activities and skills.

30. They also agreed that the new curriculum helped to develop national awareness and international understanding among students.

6.8.0 Conclusion:

Science Independence many efforts have been made by the Govt. of India to improve the standard of Secondary Education in India. National Council for Educational Research and Training (NCERT) was established in 1961 at New Delhi. Since then secondary school curriculum was revised a number of times. The National Curriculum for secondary schools in India is in no way less than the curriculum of any other advanced nations of the world. At present the course taught in CBSE schools of India is based on the National Curriculum Framework For School Education-2000. A document brought forward by the NCERT in the year 2000.

Science and Social Studies form very important part of Secondary School Curriculum and Information Technology (IT) is the need of the hour, hence it has become necessary to make use of IT in teaching learning process. Science and Social Studies should be taught with the help of IT and use of computers in schools should be maximized and traditional teaching methods have to be changed. It is more than obvious from the findings of the study that use of Information Technology in schools is still in primitive stage and will have to be improved if the CBSE schools wish to face the challenges of their time effectively. Regarding the secondary school science curriculum from the findings of the study most of the students felt that Science course was quite lengthy

and burdensome and the textbooks should include more examples, graphs etc. to make it more understandable and interesting and some unnecessary topics should be deleted from the course. In some CBSE schools laboratories were insufficient to conduct the experiments prescribed in the textbooks. Some students also desired to have an alternate science course as it was too difficult and above their level of understanding.

Regarding social studies, curriculum, the general complaint of students was that social studies textbooks were not very interesting, too lengthy and they desired to have separate books of Geography, History, Civics and Economics at lower secondary level also, instead of a single book of social studies Social studies course was not upto the mark in resolving contemporary social and individual problems and in promoting ideals of humanism, secularism, socialism and democracy. Except for these few shortcomings the science and social studies curriculum was described as quite satisfactory by the students, and also it fulfilled all the requirements of being a good curriculum. Many students stated that Science and Social Studies curriculum was quite burdensome for them due to which they could not find time for other activities. From the study it was found that certain chapters from class IX, X, XI & XII of the present Science and Social Studies textbooks may be deleted, this would reduce the volume of textbooks and would give place to new concepts. Hence the interest of such students should also be considered while designing the curriculum.

Teachers also pointed out some short-comings like science course was not organically related to community living and it did not have utility

in the practical life of students and social studies teachers opined that course content is more and cumbersome.

Curriculum forms the gamut of classroom activities. It includes not only the written course of studies but also includes the intended learning experience to be assimilated by the students based on teaching and learning experience. The teachers as mentors have the first hand experience of teaching. The teachers are the best judges to assess the quantum of learning experience that needs to be incorporated in the curriculum. Teachers opined that curriculum framed for the students does not correspond to the level of understanding of children. The quality and relevance of learning experience determines the effectiveness of curriculum implementation, it is in this perspective that more and more teachers should be involved in designing the school curriculum. Teachers working in schools have an in-depth knowledge of mental development of children. The teachers are also aware of child's sensibilities, psychological and social bearings and hence the teachers should be considered the forerunners in formulating the curriculum.

Curriculum development is a planned exercise which calls for ingenuity, experience and aptitude. It is the teachers who translates and implements instructional plans into action. Curriculum calls for planning and conceptualization from the stage of formation of syllabus to evaluation.

The need of the day is to make the curriculum learner oriented as well as value oriented. It is thus mandatory on the part of the teachers to be familiar with the modus operandi of the curriculum. The importance of Guest Lectures/ Workshops, orientation courses, parent teachers'

meeting, auditoriums, inter school sports and games, co-curricular activities, in-service computer training, career counselling are the gray areas which needs representation through the teachers as essential part of the curriculum to bring about a qualitative change in education especially Science and Social Studies Curriculum by taking help of Information Technology.

Social studies and science are not stagnant but rather ever changing curricula. The need to provide current happenings and real world applications to social studies and science means that teachers must use such current sources as electronic media that go beyond rigid textual materials.

Computers create an influential effect on the teaching and learning processes. With the use of computers in the classroom, schools would become more student-centered and that more individualized learning would take place than ever before. With the passage of time new concepts are evolving and will continue to evolve, but everything cannot be included in the syllabi. Therefore, what is needed is to strengthen the idea of "learning to learn" by giving stress on the process of learning while teaching and encouraging peer learning so that the students can acquire the needed information themselves when required. It is hoped that when secondary school science and social science curricula and textbooks are restructured and rewritten in future the curricular load on the students of classes IX, X, XI and XII be reduced to some extent providing time and space for inclusion of new concepts and scope for creative thinking by learners.

If the curriculum as prescribed by NCFSE-2000 is implemented in schools with proper infrastructure and facilities to students and with the help of trained and skilful teachers and able administration the aims and objectives of NCFSE-2000 can be fulfilled.

Teachers' play an instrumental role in this regard and their proven expertise can be aptly used in developing curriculum packages and in formulating resource designs towards a supportive educational environment.

6.9.0 Educational Implications:

- From the present study it can be implied that the curriculum for the secondary schools should be interesting for the students and it should fulfill their needs. Then only students will be interested in studies.
- Teaching in schools should be effective. To ensure this teachers need to make use of proper teaching aids especially for teaching science and social sciences. For this purpose computers should be used.
- In most of the schools there is overcrowding which hinders students capacity of learning. Therefore more secondary schools should be opened and secondary education should be made accessible to all.

- Educational standard is coming down in almost all schools, it should be stopped by employing trained and skillful teachers, admitting better quality of students.
- The rule of 75% of compulsory attendance in the classrooms should be strictly followed so that only those who are really interested in studies should join schools and should be able to pick up the teaching in the classes.
- The school buildings should also be made attractive for the students so that they get attracted towards the schools and the learning environment is created in schools.
- It should promote the goals of socialism, secularism and democracy as enshrined in our constitution.
- The education system should be kept far apart from the interference of the ruling party or any other political parties. Otherwise there are possibilities that the changes in curriculum are biased.
- It should be emphasized that opinion should be sought from maximum possible number of students, teachers, experts of the subjects and the intelligentsia in the country before implementing any national curriculum framework.
- Curriculum load for the students is too big it should be reduced by removing some topics which are repeated or where there is overlapping. Whether the concepts at this stage of learning are necessary or not, the whole issue needs further investigations, analysis and discussions.

- There can be readjustment of topics by shifting some of them to lower classes i.e. class VII & VIII and some others to graduate classes. In this way curriculum load can be reduced.
- The curriculum for the students of secondary education especially science and social science should be such that it should prepare students for vocation.
- There can be inclusion of some new topics in class IX & X social science like share market, BSE, NSE etc. so that if students do not wish to continue their studies, they can enter into the world of work.
- During the present study it was found that use of Information Technology in most of the schools in UP was either in primitive stage or not at all available. Therefore, Government should take care that all schools should have well equipped computer laboratory. Teachers may use computers to show the activities like functioning of heart, the circulatory system, eruption of volcanoes, etc. in order that students have an exact knowledge of concepts.
- The Science Laboratories were also not upto the mark in most of the schools. Care should be taken to recognize only such schools which have well equipped science laboratories and those schools which are already recognized should be inspected very often.
- In most schools, school library was also not sufficient. There should be a rich library for the benefit of students.

- ❖ For the study of geography, students should be taken to tours and marks should be allotted for this and it should form a part of students evaluation.

By adopting all the above methods the curriculum in science and social science can be made such that students and teachers are satisfied with it. The significant educational implication is that the study revealed important findings of secondary school students and teachers towards Science, Information Technology and Social Studies curriculum at secondary school level based on which worthwhile changes in the Indian National Curriculum of Science, Social Science and Information Technology can be made.

6.9.1 Suggestions for further research:

Due to limitation in terms of the scope of the present study, several related areas of curriculum remained unexamined. The investigator would like to submit her humble suggestions in the light of her experience and the results of the present study.

1. There are many subjects at secondary school stage like English, Hindi, Mathematics etc. But this study was delimited only to Science, Information Technology and Social Science. Further studies may be undertaken to include the evaluation and development of curriculum in English, Hindi, Mathematics etc.
2. This study is confined to only CBSE schools of some cities in UP. Further researches may be undertaken to include other category of schools which follow the curriculum of State Boards, ICSE, ISC etc.

3. There are many cities and towns in which CBSE schools exist. This study is confined to only five cities of U.P. namely Agra, Allahabad, Aligarh, Bareilly and Lucknow. A comprehensive study can be conducted including other cities and towns.
4. This study is confined to only one state of India i.e. Uttar Pradesh (U.P.). A comprehensive study can be conducted including other states of India
5. The present study is confined to evaluation of curriculum by teachers and students at secondary school stage. Further studies may be undertaken to include Principals and parents of students as well.

The suggestions offered are neither exhaustive nor prescriptive. The researchers will be able to conceptualize further innovative research in the related areas using their ingenuity. It is with this hope that the chapter is concluded.

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APPENDICES

APPENDICES

APPENDIX I
QUESTIONNAIRE 'A'

A survey to know the opinion of Secondary School Students (class IX & X) from few cities in U.P. towards their Science and Social Studies Curriculum

Name of the student:.....

Class passed:.....

Age:..... Sex:.....

Name of the School:..... Place:.....

The following statements relate to various aspects of the Lower Secondary School Curriculum based on the National Curriculum Framework for School Education-2000 and syllabus of the year 2003 from NCERT and CBSE textbooks of Science and Technology and Social Sciences. The purpose is to know your opinion about each statement. The answers will be used for the research purpose only. Your cooperation in this regard is greatly indebted.

DIRECTION: Read the statements carefully and mark your agreement or disagreement with each of the statements by putting a tick mark against the correct answer.

Examples:

1. You study at Home

   (i) Everyday (✓)

   (ii) Only on Sundays ( )

   (iii) Occasionally ( )

If your choice is everyday then put tick (✓) against it.

2. Do you play cricket?

   If your choice is 'Yes' put tick (✓) against yes.

Yes	No	Can't say
✓		

Begin here:

Statements related to NCERT/CBSE text books of Science and Technology are given below.

1. Your text book of Science and Technology is

   i) Easy ( )

   ii) Difficult ( )

   iii) Apt ( )

2. Subject matter in the text book is

   i) Interesting ( )

   ii) Not very interesting ( )

   iii) Boring ( )

3. The syllabus of text book is

   i) Lengthy ( )

   ii) Short ( )

   iii) Appropriate ( )

4. The Curriculum in Science and Technology is

   i) Wide and comprehensive ( )

   ii) Narrow and limited ( )

   iii) Heavy and burdensome ( )

5. Curriculum is

   i) Flexible ( )

   ii) Rigid ( )

6. With which of the following statements do you agree

   i) Studying Physics, Chemistry and Biology as an integrated subject under Science and Technology is more beneficial for students. ( )

   ii) Studying Physics, Chemistry and Biology as separate disciplines is more beneficial for students ( )

   iii) Both the above approaches are equally good. ( )

7. Science and Technology course is integrated with Information Technology.

Yes	No	Can't Say

8. It is correlated with other subjects.

Yes	No	Can't Say

9. It provides you with sufficient material on the subject.

Yes	No	Can't Say

10. Course content is sufficient enough to be covered comfortably within the given time frame of your school.

Yes	No	Can't Say

11. The experiments in Physics, Chemistry, and Biology are feasible to be performed in your school laboratory.

Yes	No	Can't Say

12. How many experiments did you perform in your school laboratory last year? If performed less than fifteen, please state reason.

.....

Yes	No	Can't Say

13. There should be two sets of curricula – advanced and ordinary in Science and Technology for class IX and X students to choose any one of them.

Yes	No	Can't Say

14. The curriculum is related to community living.

Yes	No	Can't Say

15. It encourages learning by doing.

Yes	No	Can't Say

16. It is complete in itself.

Yes	No	Can't Say

17. The language of text book is lucid, simple and precise.

Yes	No	Can't Say

18. It contains necessary examples, figures, graphs, etc.

Yes	No	Can't Say

19. It develops economic efficiency and capacity to earn livelihood.

Yes	No	Can't Say

20. It increases curiosity and power of reasoning and observation.

Yes	No	Can't Say

21. It explains happening of natural phenomenon around us.

Yes	No	Can't Say

22. Any other comments regarding your new course book in Science and Technology are solicited.

.....

.....

.....

Statements related to NCERT/CBSE text book of Social Sciences are given below:

1. The text book is

   i) Easy ( )

   ii) Difficult ( )

   iii) Apt ( )

2. Subject matter in the text book is

   i) Interesting ( )

   ii) Not very interesting ( )

   iii) Boring ( )

3. The syllabus of text book is

   i) Lengthy ( )

   ii) Short ( )

   iii) Appropriate ( )

4. The curriculum in Social Sciences is

   i) Wide and comprehensive ( )

   ii) Narrow and limited ( )

   iii) Heavy and burdensome ( )

5. The curriculum is

   i) Flexible ( )

   ii) Rigid ( )

6. With which of the following statements do you agree

   i) Studying History, Geography, Civics, and Economics as integrated subject under Social Sciences is more beneficial for students. ( )

   ii) Studying History, Geography Civics, and Economics as separate disciplines is more beneficial for students. ( )

   iii) Both the above approaches are equally good. ( )

7. Social Sciences course is integrated with Information Technology.

Yes	No	Can't Say

8. It is correlated with other subjects.

Yes	No	Can't Say

9. It provides you with sufficient material on the subject.

Yes	No	Can't Say

10. Course content is sufficient enough to be covered comfortably within the given time frame of your school.

Yes	No	Can't Say

11. The curriculum inculcates love for cultural values.

Yes	No	Can't Say

12. It develops sense of appreciation.

Yes	No	Can't Say

13. It creates national awareness and promotes international understanding.

Yes	No	Can't Say

14. It is related to community living.

Yes	No	Can't Say

15. It is complete in itself.

Yes	No	Can't Say

16. The language of the text book is lucid, simple and precise.

Yes	No	Can't Say

17. It contains necessary examples, figures, graphs, maps etc.

Yes	No	Can't Say

18. It provides social competence.

Yes	No	Can't Say

19. It is experience based (i.e. it contains a series of activities and skills).

Yes	No	Can't Say

20. It enables you to resolve your contemporary social and individual problems.

Yes	No	Can't Say

21. Any other comments regarding your new course book in Social Sciences are solicited.

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APPENDIX II
QUESTIONNAIRE 'B'

A survey to know the opinion of Secondary School Teachers of Science from few cities in U.P. towards Secondary School Science and Technology Curriculum

Name of the teacher:.....

Subjects teaching in class IX & X.....

Classes assessed:.....

Teaching experience:..... Years

Age:..... Sex:.....

Name of the School:.....Place:.....

The following statements relate to various aspects of the secondary school curriculum based on the National Curriculum Framework for School Education-2000 and syllabus of the year 2003 from NCERT and CBSE textbooks in Science and Technology. The purpose is to know your opinion about each statement. The answers will be used for the research purpose only. Your cooperation in this regard is greatly indebted.

DIRECTION: Read the statements carefully and mark your agreement or disagreement with each of the statements by putting a tick mark against the correct answer.

Examples:

1. Vocational education for students in school should begin

   (i) From class VIII onwards (✓)

   (ii) After class X ( )

   (iii) After class XII ( )

   If your choice is "From Class VIII onwards" then put tick (✓) against it.

2. Teachers possessing B.Ed. degree are more efficient in teaching profession than those who do not possess it.

   If your choice is 'Yes' put tick (✓) against yes.

Yes	No	Can't say
✓		

Begin here:

(1) The textbook of Science and Technology for the students of class IX and X is

(i) Easy ( )
(ii) Difficult ( )
(iii) Apt ( )

(2) Subject matter in NCERT / CBSE textbook for the students is

(i) Interesting ( )
(ii) Not very interesting ( )
(iii) Boring ( )

(3) Syllabus of new course of NCERT / CBSE when compared with the old course is

(i) Entirely different ( )
(ii) Not much different ( )
(iii) Not at all different ( )

(4) NCERT / CBSE course in Science and Technology textbook for the students is

(i) Lengthy ( )
(ii) Short ( )
(iii) Appropriate ( )

(5) Curriculum in Science and Technology is

(i) Wide and comprehensive ( )
(ii) Narrow and limited ( )
(iii) Heavy and Burdensome ( )

(6) Science and Technology curriculum in NCERT / CBSE textbook is

(i) Flexible ( )
(ii) Rigid ( )

(7) With which of the following statements do you agree

(i) Teaching Physics, Chemistry and Biology as an integrated subject under Science and Technology is more beneficial for students. ( )
(ii) Teaching Physics, Chemistry and Biology as separate disciplines is more beneficial for students. ( )
(iii) Both the above approaches are equally good. ( )

(8) Science and technology course is integrated with Information Technology.

Yes	No	Can't say

(9) Curriculum in Science and Technology is correlated with other subjects.

Yes	No	Can't say

(10) NCERT / CBSE textbook of Science and Technology provides the students with sufficient material on the subject.

Yes	No	Can't say

(11) Course content in Science and Technology is sufficient enough to be covered within the given time frame of the school.

Yes	No	Can't say

(12) New course is more better than the old course in providing social competence in students.

Yes	No	Can't say

(13) Curriculum in Science and Technology is related to community living.

Yes	No	Can't say

(14) Curriculum in Science and Technology helps develop in students scientific attitude and skills required at secondary school level.

Yes	No	Can't say

(15) Curriculum for classes IX and X is complete in itself.

Yes	No	Can't say

(16) The language of textbook of NCERT / CBSE in Science and Technology is lucid, simple and precise.

Yes	No	Can't say

(17) NCERT / CBSE Science and Technology textbook contains necessary examples, figures, graphs, maps etc.

Yes	No	Can't say

(18) The curriculum is sensitive to changing technology and social needs.

Yes	No	Can't say

(19) It encourages learning by doing.

Yes	No	Can't say

(20) It develops in students economic efficiency and capacity to earn livelihood.

Yes	No	Can't say

(21) It increases curiosity and power of reasoning and observation.

Yes	No	Can't say

(22) It provides the scientific outlook (free from prejudices and based on tolerance).

Yes	No	Can't say

(23) It helps in building up of proper development of personality in students.

Yes	No	Can't say

(24) It has utility in the practical life of students.

Yes	No	Can't say

(25) It makes proper exercise of mental discipline in children.

Yes	No	Can't say

(26) It develops sense of appreciation.

Yes	No	Can't say

(27) It is based on the psychological principles of learning.

Yes	No	Can't say

(28) There should be two sets of curricula – advanced and ordinary in Science and Technology for class IX and X. students to choose any one of them.

Yes	No	Can't say

(29) Can the objectives of new syllabus be achieved under normal conditions and circumstances?

Yes	No	Can't say

(30) Any other comments regarding the new course in Science and Technology for classes IX and X are solicited.

Yes	No	Can't say

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APPENDIX III
QUESTIONNAIRE 'C'

A Survey to know the opinion of Secondary School Teachers of Social Sciences from few cities in U.P. towards Secondary School Social Studies Curriculum

Name of the teacher:.....

Subjects teaching in class IX & X:.....

Classes assessed:.....

Teaching experience:..... Years.

Age:.....Years. Sex:.....

Name of the School:.....Place:.....

The following statements relate to various aspects of the Secondary School Curriculum based on the National Curriculum Framework For School Education-2000 and the syllabus of the year 2003 from NCERT and CBSE textbooks in Social Science. The purpose is to know your opinion about each statement. The answers will be used for the research purpose only. Your cooperation in this regard is greatly indebted.

DIRECTION: Read the statements carefully and mark your agreement or disagreement with each of the statements by putting a tick mark against the correct answer.

Examples:

1. Vocational education for students in school should begin

   (i) From class VIII onwards (✓)

   (ii) After class X ( )

   (iii) After class XII ( )

   If your choice is "From Class VIII onwards" then put tick (✓) against it.

2. Teachers possessing B.Ed. degree are more efficient in teaching profession than those who do not possess it.

   If your choice is 'Yes' put tick (✓) against yes.

Yes	No	Can't say
✓		

Begin here:

(1) The NCERT/CBSE textbook of Social Sciences for the students of class IX and X is

(i) Easy ( )
(ii) Difficult ( )
(iii) Apt ( )

(2) Subject matter in NCERT / CBSE textbook of Social Sciences for the students is

(i) Interesting ( )
(ii) Not very interesting ( )
(iii) Boring ( )

(3) New course when compared with old course is

(i) Entirely different ( )
(ii) Not much different ( )
(iii) Not at all different ( )

(4) New course in Social Sciences for the students is

(i) Lengthy ( )
(ii) Short ( )
(iii) Appropriate ( )

(5) The curriculum in Social Sciences is

(i) Wide and comprehensive ( )
(ii) Narrow and limited ( )
(iii) Heavy and Burdensome ( )

(6) The new curriculum in Social Sciences is

(i) Flexible ( )
(ii) Rigid ( )

(7) With which of the following statements do you agree

(i) Teaching History, Geography, Civics and Economics as an integrated subject under social Sciences is more beneficial for students. ( )
(ii) Teaching History, Geography, Civics and Economics as separate disciplines is more beneficial for students. ( )
(iii) Both the above approaches are equally good ( )

(8) The Curriculum in Social Sciences is integrated with Information Technology.

Yes	No	Can't say

(9) Curriculum in Social Sciences is correlated with other subjects.

Yes	No	Can't say

		Yes	No	Can't say
(10)	The text book of Social Sciences textbook provides the students with sufficient material on the subject.			
(11)	The Course content in new syllabus is sufficient enough to be covered within the given time frame of your school.			
(12)	The new Curriculum is more better than the previous curriculum in providing social competence in students.			
(13)	The new curriculum is related to community living.			
(14)	The Curriculum in Social Sciences is sufficient enough to develop the necessary aptitude and skills required at Secondary School level.			
(15)	Curriculum for classes IX and X is complete in itself.			
(16)	The language of NCERT / CBSE textbook in Social Sciences is lucid, simple and precise.			
(17)	NCERT / CBSE textbook of Social Sciences contain necessary examples, figures, graphs, maps etc.			
(18)	Curriculum in Social Sciences is sensitive to changing needs and values of the society.			
(19)	The Curriculum is experience based (i.e. it contains a series of activities and skills.)			

(20) It will enable the students to gain insight into spiritual economic and political values.

Yes	No	Can't say

(21) It helps children develop an insight into human relationships, social values and attitudes.

Yes	No	Can't say

(22) It intends to promote the values and ideals of humanism, secularism, socialism and democracy.

Yes	No	Can't say

(23) It provides functional relationships among different branches of social sciences.

Yes	No	Can't say

(24) It helps in building intelligent democratic citizenship in students.

Yes	No	Can't say

(25) Course content of new syllabus when compared with the old syllabus is

(i) More ( )
(ii) Less ( )
(iii) The same ( )

(26) It is based on Psychological principles of learning.

Yes	No	Can't say

(27) It develops in student's sense of appreciation.

Yes	No	Can't say

(28) It helps develop national awareness and international understanding.

Yes	No	Can't say

(29) Any other comments regarding the new course in Social Sciences for classes IX and X are solicited.

Yes	No	Can't say

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APPENDIX IV

QUESTIONNAIRE 'D'

A Survey to know the opinion of Senior Secondary School Students of Science Stream (Physics, Chemistry and Biology) from few cities in U.P. towards their Physics, Chemistry and Biology Curriculum

Name of the student: .....

Class Passed: .....

Age: ..... Sex: .....

Name of the School/College:..... Place: .....

The following statements relate to various aspects of the secondary school curriculum based on the National Curriculum Framework for School Eduaction-2000 and syllabus of the year 2003 from NCERT and CBSE textbooks of Science (Physics, Chemistry and Biology). The purpose is to know your opinion about each statement. The answers will be used for the research purpose only. Your cooperation in this regard is greatly indebted.

DIRECTION: Read the statements carefully and mark your agreement or disagreement with each of the statements by putting a tick mark against the correct answer.

Example:

1. You study at Home

i)	Everyday	(√)
ii)	Only on Sundays	( )
iii)	Occasionally	( )

If your choice is 'everyday' put tick (√) against everyday.

2. Do you play cricket?

If your choice is 'yes' put tick (√) against yes

Yes	No	Can't say
✓		

Given below are the statements related to NCERT /CBSE text books of Physics.

1. The Curriculum is

   i) Easy ( )

   ii) Difficult ( )

   iii) Apt ( )

2. Subject matter in the text books of Physics, is

   i) Interesting ( )

   ii) Not very interesting ( )

   iii) Boring ( )

3. Your text books of Physics are

   i) Lengthy ( )

   ii) Short ( )

   iii) Appropriate ( )

4. Curriculum in physics is.

   i) Wide and comprehensive ( )

   ii) Narrow and limited ( )

   iii) Heavy and burdensome ( )

5. Your Physics text books are

   i) Cheap ( )

   ii) Affordable ( )

   iii) Costly ( )

6. Semestirization of Physics course for class XI and XII is

   i) Beneficial ( )

   ii) Not very beneficial ( )

   iii) Semester pattern and annual pattern of studies are equally good ( )

7. Your Physics syllabus is integrated with Information Technology.

Yes	No	Can't Say

8. Curriculum in Physics is correlated with that of Chemistry and Biology.

Yes	No	Can't Say

9. Physics text books provide you with sufficient material on the subject.

Yes	No	Can't Say

10. Course content in your Physics text books is sufficient enough to be covered comfortably within the given timeframe of your school.

Yes	No	Can't Say

11. Curriculum is sufficient enough to develop scientific attitude and skills required at senior secondary school level.

Yes	No	Can't Say

12. Curriculum in Physics is complete in itself.

Yes	No	Can't Say

13. It is community based.

Yes	No	Can't Say

14. It encourages learning by doing.

Yes	No	Can't Say

15. The language of text books is lucid, simple and precise.

Yes	No	Can't Say

16. The text books of Physics contain necessary examples, figures, graphs, etc.

Yes	No	Can't Say

17. It increases curiosity and power of reasoning and observation.

Yes	No	Can't Say

18. The experiments in Physics are feasible to be performed in your school laboratory

Yes	No	Can't Say

19. The new course in Physics is sufficient enough to help you compete All India Medical, Engineering and other entrance examinations.

Yes	No	Can't Say

20. Any other comments regarding the new course in Physics are solicited.

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Given below are the statements related to NCERT/CBSE text books of Chemistry.

1. The Curriculum in Chemistry is

   i) Easy ( )

   ii) Difficult ( )

   iii) Apt ( )

2. Subject matter in the text books of Chemistry is

   i) Interesting ( )

   ii) Not very interesting ( )

   iii) Boring ( )

3. Your text book of Chemistry is

   i) Lengthy ( )

   ii) Short ( )

   iii) Appropriate ( )

4. Curriculum in Chemistry is

   i) Wide and comprehensive ( )

   ii) Narrow and limited ( )

   iii) Heavy and burdensome ( )

5. Your Chemistry text books are

   i) Cheap ( )

   ii) Affordable ( )

   iii) Costly ( )

6. Semestirization of Chemistry course for class XI and XII students is

   i) Beneficial ( )

   ii) Not very beneficial ( )

   iii) Semester pattern and annual pattern of studies are equally good ( )

7. Your Chemistry syllabus is integrated with Information Technology.

Yes	No	Can't say

8. Curriculum in Chemistry is correlated with that of Physics and Biology.

Yes	No	Can't say

9. Chemistry text books provide you with sufficient material on the subject.

Yes	No	Can't say

10. Course content in your Chemistry text books is sufficient enough to be covered comfortably within the given timeframe of your school.

Yes	No	Can't say

11. Curriculum is sufficient enough to develop scientific attitude and skills required at senior secondary school level.

Yes	No	Can't say

12. Curriculum in Chemistry is complete in itself.

Yes	No	Can't say

13. It is community based.

Yes	No	Can't say

14. It encourages learning by doing.

Yes	No	Can't Say

15. The language of text books is lucid, simple and precise.

Yes	No	Can't Say

16. The text books of Chemistry contain necessary examples, figures, graphs, etc.

Yes	No	Can't Say

17. The experiments in Chemistry are feasible to be performed in your school laboratory

Yes	No	Can't Say

18. The new course in Chemistry is sufficient enough to help you compete All India Medical, Engineering and other entrance examinations.

Yes	No	Can't Say

19. Does it provide scientific outlook? (free from prejudices and based on tolerance).

Yes	No	Can't Say

20. Any other comments regarding the new course in Chemistry are solicited.

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Given below are the statements related to NCERT /CBSE textbooks of Biology.

1. The Curriculum in Biology is

   i) Easy ( )

   ii) Difficult ( )

   iii) Apt ( )

2. Subject matter in the text books of Biology, is

   i) Interesting ( )

   ii) Not very interesting ( )

   iii) Boring ( )

3. Your text books of Biology are

   i) Lengthy ( )

   ii) Short ( )

   iii) Appropriate ( )

4. Curriculum in Biology is

   i) Wide and comprehensive ( )

   ii) Narrow and limited ( )

   iii) Heavy and burdensome ( )

5. Your Biology text books are

   i) Cheap ( )

   ii) Affordable ( )

   iii) Costly ( )

6. Semestirization of Biology course for class XI and XII students is

   i) Beneficial ( )

   ii) Not very beneficial ( )

   iii) Semester pattern and annual pattern of studies are equally good ( )

7. Your Biology syllabus is integrated with Information Technology.

Yes	No	Can't say

8. Curriculum in Biology is correlated with that of Chemistry and Biology.

Yes	No	Can't say

9. Biology text books provide you with sufficient material on the subject.

Yes	No	Can't say

10. Course content in your Biology textbooks is sufficient enough to be covered comfortably within the given timeframe of your school.

Yes	No	Can't say

11. Curriculum is sufficient enough to develop scientific attitude and skills required at senior secondary school level.

Yes	No	Can't say

12. Curriculum in Biology is complete in itself.

Yes	No	Can't say

13. It is community based.

Yes	No	Can't say

14. It encourages learning by doing.

Yes	No	Can't say

15. The language of textbooks is lucid, simple and precise.

Yes	No	Can't say

16. The text books of Biology contain necessary examples, figures, graphs, etc.

Yes	No	Can't say

17. It increases curiosity and power of reasoning and observation.

Yes	No	Can't say

18. The experiments in Biology are feasible to be performed in your school laboratory.

Yes	No	Can't say

19. The new course in Biology is sufficient enough to help you compete All India Medical, Agricultural and other entrance examinations.

Yes	No	Can't say

20. Any other comments regarding the new course in Biology are solicited.

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APPENDIX V
QUESTIONNAIRE 'E'

A survey to know the opinion of Senior Secondary School Teachers of Science (Physics, Chemistry & Biology) from few cities in U.P. towards their Physics, Chemistry and Biology Curriculum

Name of the teacher:.....

Subjects teaching in class X I & XII.....

Classes assessed:.....

Teaching experience:..... Years

Age:..... Sex:.....

Name of the School/College :..... Place:.....

The following statements relate to various aspects of the Senior Secondary School Curriculum based on the National Curriculum Framework For School Education-2000 and syllabus of the year 2003 from NCERT and CBSE textbooks in Physics, Chemistry & Biology. The purpose is to know your opinion about each statement. The answers will be used for the research purpose only. Your cooperation in this regard is greatly indebted.

DIRECTION: Read the statements carefully and mark your agreement or disagreement with each of the statements by putting a tick mark against the correct answer.

Examples:

1. Vocational education for students in school should begin

   (i) From class VIII onwards (✓)

   (ii) After class X ( )

   (iii) After class XII ( )

   If your choice is "From Class VIII onwards" then put tick (✓) against it.

2. Teachers possessing B.Ed. degree are more efficient in teaching profession than those who do not possess it.

   If your choice is 'Yes' put tick (✓) against yes.

Yes	No	Can't say
✓		

Begin here:

(1) The NCERT / CBSE curriculum in (Physics/Chemistry/Biology) for the students is

(i) Easy ( )
(ii) Difficult ( )
(iii) Apt ( )

(2) Subject matter in NCERT / CBSE textbooks for the students is

(i) Interesting ( )
(ii) Not very interesting ( )
(iii) Boring ( )

(3) New course when compared with old course is

(i) Entirely different ( )
(ii) Not much different ( )
(iii) Not at all different ( )

(4) The NCERT / CBSE textbooks in (Physics/Chemistry/Biology) for the students is

(i) Lengthy ( )
(ii) Short ( )
(iii) Appropriate ( )

(5) The Curriculum in (Physics/Chemistry/Biology): is {the concern subject teacher is requested to tick mark the subject he / she has assessed}.

(i) Wide and comprehensive ( )
(ii) Narrow and limited ( )
(iii) Heavy and Burdensome ( )

(6) The Curriculum in (Physics/Chemistry/Biology) is

(i) Flexible ( )
(ii) Rigid ( )

(7) New course when compared with old course is

(i) More difficult ( )
(ii) Less difficult ( )
(iii) Of the same difficulty level ( )

(8) Curriculum in (Physics / Chemistry / Biology) is integrated with Information Technology.

Yes	No	Can't say

(9) Curriculum in (Physics / Chemistry / Biology) is correlated with other subjects.

Yes	No	Can't say

(10) NCERT /CBSE textbooks in (Physics / Chemistry/ Biology) provide the students with sufficient material on the subject.

Yes	No	Can't say

(11) The Course content is sufficient enough to be covered within the given time frame of your school.

Yes	No	Can't say

(12) New course is more better than the old course in providing social competence in students.

Yes	No	Can't say

(13) It is related to community living.

Yes	No	Can't say

(14) The Curriculum is sufficient enough to develop scientific attitude and skills in pupils required at Senior Secondary School level.

Yes	No	Can't say

(15) Curriculum for classes XI and XII is complete in itself.

Yes	No	Can't say

(16) The language of NCERT/CBSE textbooks of (Physics/ Chemistry/Biology) is lucid, simple and precise.

Yes	No	Can't say

(17) NCERT / CBSE textbooks contain necessary examples, figures, graphs, etc.

Yes	No	Can't say

(18) It develops in pupils the desired skills for solving problems in their day-to-day life.

Yes	No	Can't say

(19) The curriculum in classes XI and XII provide the students with sufficient knowledge and understanding required at Senior Secondary School level.

Yes	No	Can't say

(20) It develops in students economic efficiency and capacity to earn livelihood.

Yes	No	Can't say

(21) It develops curiosity and power of reasoning and observation in students.

Yes	No	Can't say

(22) It provides the scientific outlook (free from prejudices and based on tolerance).

Yes	No	Can't say

(23) It trains pupils for efficient application of the knowledge of principles and theories of science.

Yes	No	Can't say

(24) It has utility in the practical life of students.

Yes	no	Can't say

(25) Course content of new syllabus when compared with the old syllabus is

(i) More ( )
(ii) Less ( )
(iii) The same ( )

(26) Semesterization of class XI and XII courses for students is

(i) Beneficial ( )
(ii) Not very beneficial ( )
(iii) Semester pattern and annual pattern are equally good ( )

(27) It is based on the psychological principles of learning.

Yes	No	Can't say

(28) The increase in number of experiments to be performed in School Laboratory in classes XI and XII in comparison to old course is right.

Yes	No	Can't say

(29) It is feasible to perform all the experiments of (Physics/ Chemistry/Biology) in your School Laboratory.

Yes	No	Can't say

(30) Any other comments regarding the new course in Physics, Chemistry and Biology for classes XI and XII are solicited.

Yes	No	Can't say

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APPENDIX VI

QUESTIONNAIRE 'F'

A Survey to know the opinion of Senior Secondary School Students of Social Sciences (History, Geography, Political Science and Economics) from few cities in U.P. towards their History, Geography, Political Science and Economics Curriculum

Name of the student: .....

Class Passed: .....

Age: ..... Sex: .....

Name of the School/College:..... Place: .....

The following statements relate to various aspects of the secondary school curriculum based on the National Curriculum Framework For School Eduaction-2000 and syllabus of the year 2003 from NCERT and CBSE textbooks in History, Geography, Political Science and Economics. The purpose is to know your opinion about each statement. The answers will be used for the research purpose only. Your cooperation in this regard is greatly indebted.

DIRECTION: Read the statements carefully and mark your agreement or disagreement with each of the statements by putting a tick mark against the correct answer.

Example:

1. You study at Home

i) Everyday (√)

ii) Only on Sundays (

iii)

Yes	No	Can't Say
√		

If your choice is 'everyday' put tick (√) against everyday.

2. Do you play cricket?

If your choice is 'yes' put tick (√) against yes

Begin here:

Given below are the statements related to NCERT/CBSE text books of History.

1. The curriculum in History is
   - i) Easy ( )
   - ii) Difficult ( )
   - iii) Apt ( )

2. Subject matter in History text books is.
   - i) Interesting ( )
   - ii) Not very interesting ( )
   - iii) Boring ( )

3. Your text books of History are.
   - i) Lengthy ( )
   - ii) Short ( )
   - iii) Appropriate ( )

4. The curriculum in History is
   - i) Wide and comprehensive ( )
   - ii) Narrow and limited ( )
   - iii) Heavy and Burdensome ( )

5. The new curriculum in History is
   - i) Flexible ( )
   - ii) Rigid ( )

6. Your text books of History are
   - i) Cheap ( )
   - ii) Affordable ( )
   - iii) Costly ( )

7. Semesterization of History course for class XI and XII students is
   - i) Beneficial ( )
   - ii) Not very beneficial ( )
   - iii) Semester pattern and Annual pattern are equally good ( )

8. The History course of class X and class XI is
   - i) Much correlated ( )
   - ii) Less correlated ( )
   - iii) Not correlated ( )

9. The History curriculum is correlated with different disciplines of Social Sciences.

Yes	No	Can't Say

10. Dou you use computers or make use of Information Technology for studying History wherever possible.

Yes	No	Can't Say

11. The History text books provide you with sufficient material on the subject.

Yes	No	Can't Say

12. Curriculum in History is complete in itself.

Yes	No	Can't Say

13. All the areas of Indian History (Ancient, Medieval and Modern) are given equal importance in the new curriculum. If not, which period is not covered properly?

Yes	No	Can't Say

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14. Course content in History text books is sufficient enough to be covered within the given timeframe of your school/college.

Yes	No	Can't Say

15. The text books of History are written in lucid, simple and precise language.

Yes	No	Can't Say

16. The text books of History contain necessary examples, figures, graphs, maps etc.

Yes	No	Can't Say

17. The Curriculum in History develops an insight into human relationships; social values foster national feelings and promote International understanding

Yes	No	Can't Say

18. The History curriculum develops critical appreciation of the past so that pupils personality is free from prejudices, parochialism and communalism.

Yes	No	Can't Say

19. It intends to promote "values and ideals of humanism, secularism, socialism and democracy".

Yes	No	Can't Say

20. The History curriculum is related to community living

Yes	No	Can't Say

21. Any other comments regarding the new curriculum in History are solicited.

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Given below are the statements related to NCERT/CBSE text books of Geography.

1. The curriculum in Geography is

   i) Easy ( )
   ii) Difficult ( )
   iii) Apt ( )

2. Subject matter in Geography text books is.

   i) Interesting ( )
   ii) Not very interesting ( )
   iii) Boring ( )

3. Your text books of Geography are.

   i) Lengthy ( )
   ii) Short ( )
   iii) Appropriate ( )

4. The curriculum in Geography is

   i) Wide and comprehensive ( )
   ii) Narrow and limited ( )
   iii) Heavy and Burdensome ( )

5. The new curriculum in Geography is

   i) Flexible ( )
   ii) Rigid ( )

6. Your text books of Geography are

   i) Cheap ( )
   ii) Affordable ( )
   iii) Costly ( )

7. Semesterization of Geography course for class XI and XII students is

   i) Beneficial ( )
   ii) Not very beneficial ( )
   iii) Semester pattern and Annual pattern are equally good ( )

8. The Geography course of class X and class XI is

i) Much correlated ( )

ii) Less correlated ( )

iii) Not correlated ( )

9. The Geography curriculum is correlated with different disciplines of Social Sciences.

Yes	No	Can't Say

10. Dou you use computers or make use of Information Technology for studying Geography wherever possible.

Yes	No	Can't Say

11. The Geography text books provide you with sufficient material on the subject.

Yes	No	Can't Say

12. Curriculum in Geography is complete in itself.

Yes	No	Can't Say

13. The Geography curriculum makes you understand and analyze the inter relationships between physical and human environments and their impact.

Yes	No	Can't Say

14. Course content in Geography text books is sufficient enough to be covered within the given timeframe of your school/college.

Yes	No	Can't Say

15. The text books of Geography are written in lucid, simple and precise language.

Yes	No	Can't Say

16. The text books of Geography contain necessary examples, figures, graphs, maps etc.

Yes	No	Can't Say

17. The curriculum is linked with life skills.

Yes	No	Can't Say

18. Is the curriculum experience based? (i.e. does it contain a series of activities and skills).

Yes	No	Can't Say

19. The curriculum in Geography increases curiosity, power of reasoning and observation.

Yes	No	Can't Say

20. Any other comments regarding the new curriculum in Geography are solicited.

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Given below are the statements related to NCERT/CBSE text books of Political Science.

1. The curriculum in Political Science is
   - i) Easy ( )
   - ii) Difficult ( )
   - iii) Apt ( )

2. Subject matter in Political Science text books is.
   - i) Interesting ( )
   - ii) Not very interesting ( )
   - iii) Boring ( )

3. Your text books of Political Science are.
   - i) Lengthy ( )
   - ii) Short ( )
   - iii) Appropriate ( )

4. The curriculum in Political Science is
   - i) Wide and comprehensive ( )
   - ii) Narrow and limited ( )
   - iii) Heavy and Burdensome ( )

5. The new curriculum in Political Science is
   - i) Flexible ( )
   - ii) Rigid ( )

6. Your text books of Political Science are
   - i) Cheap ( )
   - ii) Affordable ( )
   - iii) Costly ( )

7. Semesterization of Political Science course for class XI and XII students is
   - i) Beneficial ( )
   - ii) Not very beneficial ( )
   - iii) Semester pattern and Annual pattern are equally good ( )

8. The Political Science course of class X and class XI is
   - i) Much correlated ( )
   - ii) Less correlated ( )
   - iii) Not correlated ( )

9. The Political Science curriculum is correlated with different disciplines of Social Sciences.

Yes	No	Can't Say

10. Dou you use computers or make use of Information Technology for studying Political Science wherever possible.

Yes	No	Can't Say

11. The Political Science text books provide you with sufficient material on the subject.

Yes	No	Can't Say

12. Curriculum in Political Science is complete in itself.

Yes	No	Can't Say

13. The Political Science curriculum acquaints you with attitudes and values which are necessary for healthy civic and political life.

Yes	No	Can't Say

14. Course content in Political Science text books is sufficient enough to be covered within the given timeframe of your school/college.

Yes	No	Can't Say

15. The text books of Political Science are written in lucid, simple and precise language.

Yes	No	Can't Say

16. The text books of History contain necessary examples, figures, graphs, maps etc.

Yes	No	Can't Say

17. The curriculum in Political Science integrates theory and applied politics as far as possible.

Yes	No	Can't Say

18. It develops insight into political values as forces in human behavior and human relationships.

Yes	No	Can't Say

19. It intends to promote "values and ideals of humanism, secularism, socialism and democracy".

Yes	No	Can't Say

20. The Political Science curriculum is related to community living

Yes	No	Can't Say

21. Any other comments regarding the new curriculum in Political Science are solicited.

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Begin here:

Given below are the statements related to NCERT/CBSE text books of Economics.

1. The curriculum in Economics is

   i) Easy ( )
   ii) Difficult ( )
   iii) Apt ( )

2. Subject matter in Economics text books is.

   i) Interesting ( )
   ii) Not very interesting ( )
   iii) Boring ( )

3. Your text books of Economics are.

   i) Lengthy ( )
   ii) Short ( )
   iii) Appropriate ( )

4. The curriculum in Economics is

   i) Wide and comprehensive ( )
   ii) Narrow and limited ( )
   iii) Heavy and Burdensome ( )

5. The new curriculum in Economics is

   i) Flexible ( )
   ii) Rigid ( )

6. Your text books of Economics are

   i) Cheap ( )
   ii) Affordable ( )
   iii) Costly ( )

7. Semesterization of Economics course for class XI and XII students is

   i) Beneficial ( )
   ii) Not very beneficial ( )
   iii) Semester pattern and Annual Patterns are equally good ( )

8. The Economics course of class X and class XI is

   i) Much correlated ( )
   ii) Less correlated ( )
   iii) Not correlated ( )

9. The Economics curriculum is correlated with different disciplines of Social Sciences.

Yes	No	Can't Say

10. Dou you use computers or make use of Information Technology for studying Economics wherever possible.

Yes	No	Can't Say

11. The Economics text books provide you with sufficient material on the

Yes	No	Can't Say

12. Curriculum in Economics is complete in itself.

Yes	No	Can't Say

13. The Economics curriculum acquaints you with attitudes and values which are necessary for healthy civic and political life.

Yes	No	Can't Say

14. Course content in Economics text books is sufficient enough to be covered within the given timeframe of your school/college.

Yes	No	Can't Say

15. The text books of Economics is written in lucid, simple and precise language.

Yes	No	Can't Say

16. The text books of Economics contain necessary examples, figures, graphs, maps etc.

Yes	No	Can't Say

17. The curriculum in Economics integrates theory and applied politics as far as possible.

Yes	No	Can't Say

18. Curriculum in Economics links education with life skills.

Yes	No	Can't Say

19. The curriculum develops economic efficiency and capacity to earn livelihood.

Yes	No	Can't Say

20. It helps you to gain insight into spiritual, economic and political values.

Yes	No	Can't Say

21. Any other comments regarding the new curriculum in economics are solicited.

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APPENDIX VII
QUESTIONNAIRE 'G'

A Survey to know the opinion of Senior Secondary School Teachers of Social Sciences from few cities in U.P. towards Senior Secondary School Curriculum in History, Geography, Political Science and Economics

Name of the teacher:.....

Subjects teaching in class XI and XII.....

Classes assessed:.....

Teaching experience:..... Years.

Age:.....Years.

Sex:.....

Name of the School:..... Place:.....

The following statements relate to various aspects of the Senior Secondary School curriculum based on the National Curriculum Framework For School Education-2000 and the syllabus of NCERT and CBSE textbooks in History, Geography, Political Science and Economics. The purpose is to know your opinion about each statement. The answers will be used for the research purpose only. Your cooperation in this regard is greatly indebted.

DIRECTION: Read the statements carefully and mark your agreement or disagreement with each of the statements by putting a tick mark against the correct answer.

Examples:

1. Vocational education for students in school should begin

   (i) From class VIII onwards (✓)

   (ii) After class X ( )

   (iii) After class XII ( )

   If your choice is "From Class VIII onwards" then put tick (✓) against it.

2. Teachers possessing B.Ed. degree are more efficient in teaching profession than those who do not possess it.

   If your choice is 'Yes' put tick (✓) against yes.

Yes	No	Can't say
✓		

Begin here:

(1) The NCERT/CBSE Curriculum in (History/Geography/Political Science/ Economics for the students is {the concerned subject teacher is requested to tick mark the subject he/she has assessed}.

(i) Easy ( )
(ii) Difficult ( )
(iii) Apt ( )

(2) Subject matter in NCERT / CBSE textbooks is

(i) Interesting ( )
(ii) Not very interesting ( )
(iii) Boring ( )

(3) New course when compared with old course is

(i) Entirely different ( )
(ii) Not much different ( )
(iii) Not at all different ( )

(4) New course in (History/Geography/Political Science/ Economics) for the students is

(i) Lengthy ( )
(ii) Short ( )
(iii) Appropriate ( )

(5) The curriculum in (History/Geography/Political Science/ Economics) is.

(i) Wide and comprehensive ( )
(ii) Narrow and limited ( )
(iii) Heavy and Burdensome ( )

(6) The Curriculum in (History/Geography/Political Science/ Economics) is

(i) Flexible ( )
(ii) Rigid ( )

(7) New course when compared with old course is

(i) More difficult ( )
(ii) Less difficult ( )
(iii) Of the same difficulty level ( )

(8) The Curriculum in (History / Geography / Political Science/Economics) is integrated with Information Technology.

Yes	No	Can't say

(9) The Curriculum in (History / Geography / Political Science/ Economics) is correlated with other subjects.

Yes	No	Can't say

(10) The NCERT/CBSE textbooks provide the students with sufficient material on the subject.

Yes	No	Can't say

(11) The Course content is sufficient enough to be covered within the given time frame of your school.

Yes	No	Can't say

(12) The new Curriculum is more better than the previous curriculum in providing social competence in students.

Yes	No	Can't say

(13) It is related to community living.

Yes	No	Can't say

(14) The Curriculum in (History / Geography / Political Science / Economics) is sufficient enough to develop the necessary aptitude and skills required at Secondary Senior School level.

Yes	No	Can't say

(15) Curriculum for classes XI and XII is complete in itself.

Yes	No	Can't say

(16) The language of NCERT / CBSE textbook in Social Sciences is lucid, simple and precise.

Yes	No	Can't say

(17) NCERT / CBSE textbooks of History, Geography, Political Science and Economics for classes XI and XII contain necessary examples, figures, graphs, maps etc.

Yes	No	Can't say

(18) New Curriculum is sensitive to changing needs and values of the society.

Yes	No	Can't say

(19) The Curriculum provides students with sufficient knowledge and skills required at Senior Secondary School Level.

Yes	No	Can't say

(20) It acquaints the students with attitudes and values, which are necessary for healthy, civic and political life.

Yes	No	Can't say

(21) The new Curriculum provides functional relationships among different Social Sciences.

Yes	No	Can't say

(22) The content of the subject will enable the pupils to rise above the narrow parochial, chauvinistic and obscurantist tendencies.

Yes	No	Can't say

(23) It develops an insight into various democratic processes.

Yes	No	Can't say

*(24) All the areas of Indian History (Ancient, Medieval, and Modern) are given equal importance in the new curriculum. If not, which period is not done justice.

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Yes	No	Can't say

*(25). The curriculum in History develops critical appreciation of the past so that pupils personality is free from prejudices, parochialism and communalism.

Yes	No	Can't say

(26) Course content of new syllabus when compared with the old syllabus is

(i) More ( )
(ii) Less ( )
(iii) The same ( )

(27) Semesterization of XI and XII courses for students is

(i) Beneficial ( )
(ii) Not very beneficial ( )
(iii) Semester pattern and annual pattern are equally good ( )

(28) The new framework has reduced curriculum load.

Yes	No	Can't say

(29) The Curriculum is experience based (i.e. it contains a series of activities and skills.)

Yes	No	Can't say

(30) It helps develop in students national awareness and international understanding.

Yes	No	Can't say

(31) Any other comments regarding the new course in Social Sciences (History / Geography / Civics/ Economics) for classes XI and XII are solicited.

Yes	No	Can't say

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*Q. 24 and Q. 25 are to be answered by the teachers of History only.

APPENDIX-VIII

SCIENCE AND TECHNOLOGY.

CLASS IX- 2003

CONTENTS

IV. NATURAL RESOURCES

V. OUR ENVIRONMENT

HISTORY.

CLASS IX-2003.

Contents

GEOGRAPHY, CIVICS AND ECONOMICS.
CLASS IX - 2003.

CONTENTS

SYLLABUS IN INFORMATION TECHNOLOGY
CLASS IX – 2003
INTRODUCTORY INFORMATION TECHNOLOGY

UNIT-I – IT BASICS

Convergence of Technologies:
Computer System: Characteristics of a computer, basic applications of a computer, components of a computer system – control.
Processing Unit (CPU), Visual Display Unit (VDU), Keyboard;
Concept of Memory: Primary and Secondary Memory, RAM and ROM, Units of Memory-Byte, Kilobyte, Megabyte, Gigabyte, Tetrabyte, Input/Output Devices:
Mouse, Joy Stick, Scanner, Microphone, OCR, MICR, Light Pen, Bar Code Reader, Digital Camera, Printer, Speaker, Plotter.
Storage Devices: Computer Languages: Machine language, Assembly Language and High Level Languages, Role of Assembler and Compiler.
Types of Software: System, Utility and Application Software.
Communication Technology: Need for networking, LAN, MAN and WAN.
Data Communication Device: Modem, Introduction to Internet.
Content: Data, Information & Multimedia.

Unit-2 – IT Tools

MS-Windows: Basic concept of an Operating System and its functions.
Introduction to Windows: Using Mouse and moving icons on the screen. My computer, Recycle bin, Task bar, Start-menu and menu selection, running and application, setting system data and time; windows explorer to view files, folders and directories, creating and renaming of files and folders, opening and closing of windows, minimize, restore and maximize forms of windows, basic components of a window: Desktop, Frame, Title Bar, Menu Bar, Status Bar, Scroll Bars (Horizontal and Vertical), using right button of the mouse, creating shortcut, basic windows accessories, notepad, paint, calculator, wordpad, using clipboard.

MS-OFFICE

MS Word: Introduction to a word processor, creating and saving a document, editing and formatting a document, text style (B, I.U.), font type, size changing color, alignment of text, formatting paragraphs with line or paragraph spacing, adding headers and footers numbering pages, using grammar and spell check utilizes, using subscript and superscript, inserting symbols, print preview, printing a document. Inserting Word Art, Clipart and Pictures, Page Setting, Bullets and Numbering, Borders and Shading, Format Painter, Find and Replace, Inserting Tables, inserting, deleting-rows and columns, merging cells, splitting cells, using auto format: Mail Merge.

MS Power Point: Introduction to Presentation graphics, Understanding the concept of slide shows, Basic elements of a slide, Different types of slides layouts, Creating and saving a presentation, Different views of a slide, Normal view, Slide sorter view and Slide show, Editing and Formatting a slide: Adding Titles, Subtitles, Text, Background, Watermark, Headers and Footers, Numbering Slides.

Inserting Pictures form files, Animating pictures and Text with Sound Effects, Timing Text box, pictures and slides, Rehearse Timings, Ungrouping and Grouping pictures from clipart.

MS Excel: Introduction to spreadsheets, concept of worksheets and workbooks, creating and saving a worksheet, worksheet with a spreadsheet; entering numbers, text, date/time, series using Auto Fill, Editing and formatting a worksheet including changing colour, size, font, alignment of text, inserting or deleting cells, rows and columns, formulae-entering a formula in a cell, using operators (+, -, *,/) in formulae, relative referencing, absolute referencing and mixed referencing, printing a worksheet. Use simple statistical functions, SUM ( ), AVERAGE ( ), MAX ( ), MIN ( ), IF ( ), (Without compound statements); inserting tables in worksheet, Embedding charts of various types: Line, Pie, Scatter, Bar and Area in a worksheet.

HISTORY.
CLASS X - 2003

Contents

GEOGRAPHY, CIVICS AND ECONOMICS
CLASS X- 2003.

Contents

INTRODUCTORY INFORMATION TECHNOLOGY
CLASS X – 2003

UNIT-1: IT BASICS

Internet: World Wide Web, Web Servers, Web sites, Web Pages, Web Browsers, HTML, Web address, Email address, URL, HTTP.
Services available on Internet: Information Retrieval, Electronic Mails, Locating sites using search engines and finding people on the net, Chat, Video Conferencing, FTP, Downloading and Uploading files from or two remote site, Newsgroup.

UNIT-2: IT TOOLS

MS-Office; MS Access:
Basic Concepts and need for a database, Creating a database, Setting the Primary Key Entering data into a database, Inserting and deleting fields, Inserting and deleting Records.

Data Validation: Field Size, Default Value Validation Rule, Validation Text, Required, Allow Zero Length.

HYPERTEXT MARKUP LANGUAGE
Basic Concept of Web Browsers with emphasis on popular browsers Internet Explorer and Netscape Navigator.

HTML Fundamentals:
Introduction to Web Page Designing using HTML, Creating and saving an HTML document, Elements in HTML: Container and Empty elements, Designing web pages using the following elements:
HTML, HEAD, TITLE, BODY (Attributes: BACKGROUND, BGCOLOR, TEXT, LINK ALINK, VLINK, LEFTMARGIN, TOPMARGIN), FONT (Attributes: COLOR, SIZE, FACE),
BASEFONT (Attributes: COLOR, SIZE, FACE), CENTER, BR (Break), HR (Horizontal Rule, Attributes: SIZE, WIDTH, ALIGN, NOSHADE, COLOR), COMMENTS,! For comments, H1.. H6 (Heading), P (Paragraph), B (Bold), I (Italics), U (Underline), UL & OL (Unordered List & Ordered List Attributes: TYPE, START), LI (List Item), Insertion of Images using the element IMG (Attributes: SRC, WIDTH, HEIGHT, ALT, ALIGN)
Internal and External Linking between Web Pages: Significance of linking, A-Anchor Element (Attributes: NAME, HREF, TITLE, ALT)

UNIT-3: IT APPLICATIONS

Students are suggested to work on the following areas using Access and HTML on topics implementing the tools covered in the course.

Domains:
Database

- Personal Data Management System

- Employee Payroll
- Stock Inventory

Website Designing

- Travel and Tourism
- Rural India
- School Website
- Environment and Pollution

APPENDIX - X.

PHYSICS.
CLASS XI - 2003.

CONTENTS

CHAPTER 12

THERMODYNAMICS

CHAPTER 13

HEAT TRANSFER

CHAPTER 14

OSCILLATIONS

CHAPTER 15

WAVES

CHEMISTRY.

CLASS XI- 2003.

CONTENTS

4.5 Types of Elements: *s, p, d, f* - Blocks
4.6 Periodic Trends in Properties of Elements

Unit 5 First Law of Thermodynamics and Chemical Energetics

5.1 Some Basic Concepts in Thermodynamics
5.2 First Law of Thermodynamics
5.3 Heat Capacity and Specific Heat Capacity
5.4 Measurement of ΔU and ΔH: Calorimetry
5.5 Standard Enthalpy Changes
5.6 Thermochemical Equations
5.7 Enthalpy Changes During Phase Transformations
5.8 Hess's Law of Constant Heat Summation
5.9 Standard Enthalpies of Formation
5.10 Bond Enthalpies
5.11 Sources of Energy

Unit 6 Chemical Bonding and Molecular Structure

6.1 Kossel-Lewis Approach to Chemical Bonding
6.2 The Ionic Bond
6.3 The Covalent Bond
6.4 The Valence Shell Electron Pair Repulsion(VSEPR) Theory — Shapes (Geometry) of Molecules
6.5 Valence Bond Theory

Unit 7 Equilibrium I: Equilibrium in Physical and Chemical Processes

7.1 Equilibrium in Physical Processes
7.2 Equilibrium in Chemical Processes — Dynamic Equilibrium
7.3 Law of Chemical Equilibrium and Equilibrium Constant
7.4 Homogeneous Equilibria
7.5 Heterogeneous Equilibria
7.6 Application of Equilibrium Constants
7.7 Factors Affecting Equilibria

Unit 8 Equilibrium II : Ionic Equilibrium in Solutions

8.1 Acids, Bases and Salts
8.2 Ionization of Acids and Bases
8.3 The Acid-Base Titration using Indicators
8.4 Buffer Solutions
8.5 Solubility Equilibria of Sparingly Soluble Salts

Unit 9 Redox Reactions

9.1 Role of Electrons in Reduction - Oxidation Reactions
9.2 Oxidation Numbers
9.3 Balancing Chemical Equations
9.4 Electrochemical Cells

SEMESTER II

Unit 10 Principles and Processes of Extraction of Elements

10.1 Origin of Elements
10.2 Distribution of Elements on Earth
10.3 Abundance of Elements in the Earth's Crust

BIOLOGY.
CLASS XI- 2003

Contents

UNIT ONE
THE LIVING WORLD

Chapter 3 Origin and Evolution of Life

UNIT TWO
DIVERSITY OF LIFE

Chapter 4 Systematics

Chapter 5 Classification of Plants

UNIT THREE
CELL AND CELL DIVISION

UNIT FOUR
GENETICS

Chapter 12 Genetic Basis of Inheritance

Chapter 13 Chromosomal Basis of Inheritance

Chapter 14 Nature of Gene: Its Expression and Regulation

Chapter 15 Genetic Engineering, Cloning and Genomics

UNIT FIVE
MORPHOLOGY OF PLANTS AND ANIMALS

Chapter 16 Morphology of Flowering Plants

SYLLABUS IN HISTORY
CLASS XI – 2003
ANCIENT INDIA

Chapter 1 THE STUDY OF INDIAN HISTORY

Chapter 2 ANCIENT INDIAN HISTORY WRITING
Indian Tradition of History Writing – Early Foreigners- Christian Missionaries and Enlightenment-Imperialist Historiogrpahy – Nationalist Approach – Marxist School of History – Multi-Disciplinary Approach.

Chapter 3 THE SOURCES OF ANCIENT INDIAN HISTORY
Literary Sources-Foreign Accounts-Archaeological Sources-Archaeological, Monuments, Excavations and Explorations.

Chapter 4 THE GEOGRAPHICAL BACKGROUND OF INDIAN HISTORY
The Himalayas – Indo – Gangetic - Brahmaputra Plain - The Deccan Plateau and Central India-Climate-The Geography of India as Described in Ancient Indian Literature-Influences of Geography on Indian History.

Chapter 5 THE STONE AGE CULTURES
Introduction-Age of the Earth-Early Humans-Earliest Palaeolithic Tools-Palaeolithic Cultures-Mesolithic Culture- Prehistoric Rock Art.

Chapter 6 THE NEOLITHIC AGE: THE BEGINNING OF SETTLED LIFE

Chapter 7 THE CHALCOLITHIC CULTURES OF INDIA
Trade and Commerce-Religious Beliefs-Technology-Copper Hoard Culture-OCP Culture.

Chapter 8 THE HARAPPAN CIVILIZATION
Town Planning-Materials Used in Buildings-types of Buildings-Public Buildings-Streets and Drains-Crafts and Industries-Trade and Commerce-Weights and Measures- Transport and Travel-Agriculture-Arts-Script-Religion- Social Stratification and Political Setup-Disposal of the Dead-Chronology-Decline-Late Harappan Cultures.

Chapter 9 THE VEDIC CIVILIZATION
The *Vedas* – The *Brahmanas-Aranyakas* and *Upanishads* Authorship of the Vedic Literature-Age of *Rig Veda*-Rig Vedic Geography-Rigvedic States-Polity and Administration Society-Education-Food and Drinks-Economic Life-Religion and Philosophy-The Question of the Aryan Invasion-Harappan Civilization and the RigVeda.

Chapter 10 THE LATER VEDIC AGE

SYLLABUS IN GEOGRAPHY
CLASS XI – 2003

PART A. FUNDAMENTALS OF PHYSICAL GEOGRAPHY

Unit 1: Geography as a Discipline

(a) Geography as an integrating discipline, as a science of spatial attributes

(b) Branches of geography: importance of physical geography.

Unit 2: The Earth

(a) Origin and evolution of the earth, continents and oceans; interior of the earth; Wegener's continental drift theory, theory of plate tectonics: earthquakes and volcanoes.

(b) Rocks and minerals: Their characteristics, major type of rocks: soils formation, major types and characteristics.

Unit 3: Landforms

(a) Concept of evolution of landforms, typology of landforms.

(b) Geomorphic processes weathering and mass wasting, erosion and deposition.

Unit 4: Climate

(a) Atmosphere-composition and structure; elements of weather and climate.

(b) Insolation-angle of incidence and distribution; heat budget of the earth-heating and cooling of atmosphere, conduction, convection, terrestrial radiation, advection; temperature-factors controlling temperature; distribution of temperature-horizontal and vertical; inversion of temperature.

(c) Pressure – pressure belts, winds, planetry, periodic and local, air masses, fronts and cyclones.

(d) Precipitation evaporation; condensation dew, frost, fog, mist and cloud, rainfall-convectional, orographic and cyclonic; world distribution of rainfall.

(e) World climates-classification (Trewartha); greenhouse effect, global warming and global climatic changes.

Unit 5: Water (Oceans)

(a) Distribution of water bodies on the earth's surface, hydrological cycle.

(b) Ocean-Submarine relief; distribution of temperature and salinity; movements of ocean water-waves, tides and currents.

Unit 6: Life on the Earth

Biosphere – its functioning; importance of plants and other organisms; biodiversity and conservation; ecosystems, energy flow, and ecological balance.

PART B. INDIA – PHYSICAL ENVIRONMENT

Unit 8: Introduction

(a) Location – as a factor in shaping India's place in the world.

(b) Geological history.

Unit 9: Physiography

(a) Geological structure and Relief Features

(b) Drainage systems – the Himalayan and the Peninsular; concept of watershed.

(c) Physiographic divisions.

Unit 10: Climate, Vegetation and Soil

(a) Weather and climate – spatial and temporal distribution of temperature, pressure, winds and rainfall; Indian monsoons; mechanism, onset and withdrawal of monsoon and variability of rainfall – spatial and temporal; climatic types.

(b) Natural vegetation – biotic resources; forest – types and distribution; wildlife; conservation and management; biosphere reserves.

(c) Soils – major types (ICAR's classification) characteristics and their distribution, soil deterioration, conservation and management.

Unit 11: Natural Hazards and Disasters: Causes and Consequences

(a) Earthquakes

(b) Landslides

(c) Droughts

(d) Floods

(e) Cyclones

C. PRACTICAL WORKS

Unit 1: Fundamentals of Maps

(a) Maps – types; scale – types; construction of linear scales, measuring distance, finding directions and use of symbols.

(b) Latitudes, Longitudes and time;

(c) Map projection: types; construction and properties of conical with one standard parallel and Mereator's projection

Unit 2: Topographic and Weather Maps

(a) Study of topographic maps (1:50,000 or 1:25,000, Survey of India maps): contour cross – section and identification of landforms: hills, valleys, waterfalls, cliffs; distribution of settlements.

(b) Air – photos and satellite imageries: identification of physical and cultural features on the basis of tone and shape.

SYLLABUS IN POLITICAL SCIENCE
CLASS XI – 2003

SOCIETY, STATE AND THE INDIAN GOVERNMENT

Unit 1: Political Science and Its Meaning and Significance

(a) Meaning, Nature (is it a science) and scope.
(b) Relation with History, Economics, Ethics, Sociology.
(c) Significance of the study of Political Science.

Unit 2: State, Society and Association

(i) State and Society
  (a) State; its meaning and elements.
  (b) State and Society, State and Government, State and Nation.
(ii) State and Association
  (a) Association: Meaning and Kinds.
  (b) State and Association including conflicts and coordinatioin.

Unit 3: Political System and Government

(i) Political System: Meaning of the concept.
(ii) Constitution.
  (a) Its meaning and significance.
  (b) Kinds of Constitution
(iii) Forms of Government
  (a) Democratic and non-democratic
  (b) Parliamentary and Presidential.
  (c) Unitary and Federal.

Unit 4: Indian Polity

(i) Landmarks in the Constitutional Development.
(ii) Making of the Constitution.
Indian National Movement and constitutional changes (Acts of 1909, 1919, 1935 and 1947).
(iii) Preamble to the Constitution.
(iv) Basic Features of the Constitution.
(v) Procedure of Amendment in the Constitution.
(vi) Indian Federation – Constitutional provisions and working.

Organs of Government

Unit 5: Legislature

(a) Types of Legislature: Unicameral and Bicameral.
(b) Function and Role.

Unit 6: Legislature in India

(a) Parliament (Lok Sabha and Rajya Sabha) – Composition.
(b) Functions and Role.
(c) State Legislature (Vidhan Sabha and Vidhan Parishad) – Composition and functions.

(d) Legislative Procedure.

Unit 7: Executive

(a) Types of executive, nominal and real, Singular and Plural.
(b) Functions, Role and Position.

Unit 8: Executive in India

(a) President: election, powers (including emergency powers) role and positions.
(b) Vice-President: election and functions.
(c) Prime Minister and Council of Ministers.
(d) Governor: appointment, role, powers and functions.
(e) Chief Minister and the Council of Ministers.

Unit 9: Civil Service (Bureaucracy)

(a) Nature and importance of bureaucracy as permanent executive.
(b) Relation between Political and Permanent executive.

Unit 10: Civil Services in India

(a) Structure, functions and role.
(b) Union Public Service Commission – Composition and Powers.
(c) State Public Service Commission – Composition and Powers.

Unit 11: Judiciary

(a) Role and Importance
(b) Independence of Judiciary

Unit 12: Judiciary in India

(a) The Supreme Court-organization and jurisdiction.
(b) High Court – organization and jurisdiction.
(c) Subordinate Courts.
(d) Public interest litigation, Lok Adalats.
(e) Problems relating to speedy and inexpensive justice.

SYLLABUS IN ECONOMICS
CLASS XI – 2003

EVOLUTION OF THE INDIAN ECONOMY

Unit 1: Indian Economy at the time of Independence

Unit 2: Economic Development Since Independence

Development plans: objectives and strategy of development
Economic growth and structural changes
Growth of investment and saving
Price rise: causes, consequences and remedies.
Population growth and Human resource development.
Unemployment, poverty and inequality.
Achievements and Shortcomings

Unit 3: Industrial Policy and Balance of Payments

Industrial Policy resolution of 1956, Role of Public Sector, Licensing Policy
Balance of trade: meaning of balance of payments.
Problem of deficit in Indian balance of payments, measures to correct the deficit: import substitution and export promotion.

Unit 4: New Economic Policy

Need
Broad features

APPENDIX- XI.

PHYSICS
CLASS XII - 2003

CONTENTS

CHAPTER 12

DUAL NATURE OF RADIATION AND MATTER

CHAPTER 13

ATOMS

CHAPTER 14

NUCLEI

CHAPTER 15

SEMICONDUCTOR ELECTRONICS: MATERIALS, DEVICES AND SIMPLE CIRCUITS

CHEMISTRY
CLASS XII -2003

CONTENTS

Unit 12 Stereochemistry

12.1 Plane-Polarised Light and Optical Activity
12.2 Molecular Asymmetry, Chirality and Enantiomers
12.3 Elements of Symmetry
12.4 Fischer Projection Formula
12.5 Absolute Configuration: The *R*, *S* and D, L Configuartion Descriptors
12.6 Compounds containing more than one Chiral Centres - *Diastereomers* and *Meso* Compounds
12.7 Resolution of a Racemic Mixture
12.8 Chemical Reactions and Stereochemistry
12.9 The Importance of Stereochemistry

Unit 13 Organic Compounds with Functional Groups Containing Oxygen-I (Alcohols, Phenols and Esters)

13.1 Classification
13.2 Nomenclature
13.3 Structures of Functional Groups
13.4 Alcohols and Phenols
13.5 Ethers
13.6 Some Commercially Important Compounds

Unit 14 Organic Compounds with Functional Groups Containing Oxygen-II (Aldehydes, Ketones, Carboxylic Acids and their Derivatives)

14.1 Aldehydes and Ketones
14.2 Carboxylic Acids
14.3 Functional Derivatives of Carboxylic Acids

Unit 15 Organic Compounds with Functional Groups Containing Nitrogen

15.1 Nitro Compounds
15.2 Amines
15.3 Cyanides and Isocyanides
15.4 Diazonium Salts
15.5 Some Commercially Important Compounds

Unit 16 Polymers

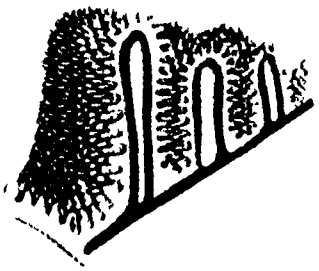
16.1 Classification of Polymers
16.2 General Methods of Polymerization

BIOLOGY

CLASS XII - 2003

CONTENTS

UNIT SEVEN
PHYSIOLOGY OF ANIMALS



UNIT EIGHT

REPRODUCTION, GROWTH AND DEVELOPMENT

UNIT NINE
ECOLOGY AND ENVIRONMENT

UNIT TEN
BIOLOGY IN HUMAN WELFARE

SYLLABUS IN HISTORY
CLASS XII – 2003
MODERN INDIA

Chapter 1	India in the late Eighteenth Century
Chapter 2	The Advent of Europeans and the Rise of British Paramountcy.
Chapter 3	The British Administrative Structure and Organization of Government in India (1757-1857).
Chapter 4	The Revolt of 1857
Chapter 5	Changes After 1857
Chapter 6	Some Major Armed Uprisings
Chapter 7	Social and Cultural Awakening in 19th Century India
Chapter 8	The Indian National Congress (1885-1905)
Chapter 9	Partition of Bengal and the *Swadeshi* Movement
Chapter 10	Revolutionary Movements
Chapter 11	Muslim Politics and Nationalist Movement
Chapter 12	Mahatma Gandhi, National Movement and Revolutionary Activities
Chapter 13	Constitutional Activities and the Civil Disobedience Movement
Chapter 14	The Second World War and the Indian National Movement
Chapter 15	India Towards Partition
Chapter 16	Making of the Indian Constitution and Liberation of Goa and Pondicherry

SYLLABUS IN GEOGRAPHY
CLASS XII – 2003

A. FUNDAMENTALS OF HUMAN GEOGRAPHY

Unit 1: Human Geography: Nature and Scope

Unit 2: People

(a) Population of the world – distribution, density and growth.

(b) Population change – spatial patterns and structure, determinants of population change.

(c) Age-sex ratio; rural-urban composition.

(d) Human development-concept; selected indicators, international comparisons.

Unit 3: Human Activities

(a) Primary activities – concept and changing trends; gathering, pastoral, mining, subsistence agriculture, modern agriculture; people engaged in agriculture and allied activities.

(b) Secondary activities – concept; manufacturing: agro-processing, household, small scale, large-scale; people engaged in secondary activities.

(c) Tertiary activities – education, health, business, transport and communication; people engaged in services.

(d) Quaternary activities – concept; specialized knowledge-based activities.

Unit 4: Transport, Communication and Trade

(a) Land transport – roads, railways-rail-network; trans-continental railways.

(b) Water transport – inland waterways; major ocean routes and ports.

(c) Air transport and the shrinking world – inter-continental air routes.

(d) Oil and gas pipelines.

(e) Mass communication; satellite communication including computer networking-internet; cable and wireless communication.

(f) International trade – its basis and changing patterns; ports as gateways of international trade, role of WTO in international trade.

Unit 5: Human Settlements

(a) Settlements types – rural and urban; problems of human settlements in developing countries; distribution of large cities.

B. INDIA – PEOPLE AND ECONOMY

Unit 6: People of India

(a) The people of India – social, linguistic and religious composition – Unity in Diversity.

(b) Population: distribution and density; population change through time – regional variations.

(c) Demographic patterns in terms of rural-urban, age-sex, workers and non-workers.

(d) Human Development – selected indicators and regional patterns.

(e) Population, environmental and development.

Unit 7: Human Settlements

(a) Rural settlements – house types, types of rural settlements, distribution pattern.

(b) Urban settlements – distribution, census and functional classification.

Unit 8: Resources and Sustainable Development

(a) Resources – concept of resources; types and distribution; utilization of resources; conservation of natural resources, sustainable development.

(b) Water resources-availability and utilization – irrigation and other uses; scarcity of water and conservation methods-water to harvesting and watershed management.

(c) Land use; general land use; agricultural land use – major crops; intensity of cropping. Agricultural issues and development.

(d) Mineral and energy resources – Distribution, utilization and conservation of resources, major metallic and non-metallic minerals. Conventional and non-conventional energy resources.

(e) Industries – types and distribution; industrial location and clustering; changing pattern of selected industries – iron and steel, cotton textiles, sugar, petrochemicals and knowledge based industries, impact of liberalisation, privatisation and globalisation on industrial development.

(f) Planning in India; need for sustainable development.

Unit 9: Transport, Communication and International Trade

(a) Transport and communication – roads, railways, waterways and airways, oil and gas Pipelines, national electric girds; communication networking – radio, television, satellite and computers.

(b) International trade – changing pattern of India's foreign trade; sea ports and airport as gate ways of international trade.

Unit 10: Geographical Perspective on Selected issues and problems

(a) Environment degradation.

(b) Hunger and poverty.

(c) Urbanization – growth of cities; rural-urban migration; problem of slums; urban-waste disposal.

C. PRACTICAL WORK

Unit 1: Processing of Data and Thematic Mapping

(a) Data analysis, diagrams and maps.

(b) Tabulating and processing of data matrix; uses and calculation of average, deviation measure and correlation.

(c) Representation of data: construction of diagrams; bars, circles and flowchart; preparation of thematic maps; dot, choropleth and isopleth.

(d) Use of computers in data processing and mapping.

Unit 2: Field Study or Spatial Information Technology

Field visit and study; map orientation, observation and preparation of sketch; survey on any one of the local concerns, (i) pollution (ii) groundwater changes (iii) land-use and land-use changes (iv) poverty (v) energy issues (vi) land degradation (vii) drought and flood.

SYLLABUS IN POLITICAL SCIENCE
CLASS XII – 2003

CONCEPTS AND THEORIES IN POLITICAL SCIENCE

Unit 1: Key Concepts

(a) Law: meaning, sources, kinds, law and morality.
(b) Liberty: meaning, kinds, law and liberty.
(c) Equality: meaning, kinds, liberty and equality
(d) Justice: meaning and dimensions

Unit 2: Major Political Theories

(a) Liberalism (b) Socialism (c) Marxism (d) Fascism (e) Gandhism

Unit 3: Sphere and Limits of State Activity

(a) Changing Concept of State Activity
(i) Idealist (ii) Individualist (iii) Anarchist (iv) Collectivist
(b) State Activity in Modern Times
(i) Welfare (ii) Developmental

Unit 4: India – A Welfare State (including Directive Principles of State Policy)

Directive Principles of State Policy and their relevance.

Unit 5: Rights and Duties

(a) Meaning and Kinds of Rights.
(b) Meaning and Kinds of Duties.
(c) Relation between Rights & Duties.

Unit 6: Fundamental Rights and Duties in India

(a) Fundamental Rights
(b) Fundamental Rights and Directive Principles – Distinction and relation.
(c) Fundamental Duties

INDIAN DEMOCRACY AT WORK

Unit 7: Electorate and Representation

(a) Audit Franchise.
(b) Systems of Representation.
(i) Territorial and Functional
(ii) Simple Majority,
(iii) Proportional Representation – Single Transferable Vote and List system.
(iv) Minority Representation – Cumulative vote system, second vote plan.

Unit 8: Electoral System in India

(a) Election Commission – Composition, powers and functions.
(b) Audit Franchise.
(c) Election Procedure
(d) Electoral Reforms

Unit 9: Party System and Public Opinion

(a) Political Parties – meaning, functions and role.

(b) Party Systems: One party, two party, multiparty.

(c) Public Opinion – Meaning and role.

(d) Agencies of Public Opinion-Political Parties, Interest Groups, Press, Electronic Media, Educational Institutions.

Unit 10: Party System in India

(a) Nature of Party System in India.

(b) National and Regional Parties.

(c) Study of major political parties.

(d) Role of opposition in Indian democracy.

(e) Interest Groups in India.

Unit 11: Local Self-Government in India

(i) Urban Local Government

(a) Municipal Corporation: Composition, Functions and Role.

(b) Municipal Committee/Municipal Boards: Composition, Functions and Role.

(ii) Rural Local Government

(a) Panchayati Raj – Structure and Functions.
1. Gram Panchayat, 2. Panchayat Samiti, 3. Zila Parishad.

Note: The above topics are to be taught in the light of 73rd and 74th constitutional amendments.

Unit 12: Challenges to Indian Democracy

(a) Inequality: social and economics

(b) Illiteracy, Population explosion.

(c) Regional imbalances, Linguism, Communalism, Casteism.

(d) Violence and Separation.

Unit 13: Socio-Economic Development in India

(a) Planning for Socio-Economic Development

(1) Planning Commission: functions and role.

(2) National Development Council: functions and role.

(b) Development of Scheduled Castes and Scheduled Tribes

(1) Scheduled Castes and Scheduled Tribes Commission: functions and role.

(c) Development of Backward Classes – implementation of the Mandal Commission Report.

Unit 14: India and the World

(a) Foreign Policy of India.

(b) (i) India and her neighbours – Bangladesh, China, Nepal, Pakistan and Sri Lanka.

(ii) India, Russia and USA.

(c) United Nations – its principal organs.

(d) India and the U.N. System.

(e) India and Selected World Problems, e.g., Human Rights, Disarmament and NIEO (New International Economic Order)